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29 April 1981

Worldwide Report

ENVIRONMENTAL QUALITY

No. 303



FOREIGN BROADCAST INFORMATION SERVICE

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CONTENTS

WORLDWIDE AFFAIRS

Baltic Sea Environment Commission Worried Over Pesticides (UUSI SUOMI, 19 Feb 81).....	1
Baltic Environment Group Agrees on Hazardous Cargo Study (UUSI SUOMI, 20 Feb 81).....	2

ASIA

AUSTRALIA

Secret Imports of Agent Orange Suspected in Birth Defects Increase (Nicholas Rothwell, Wio Joustra; THE AUSTRALIAN, 24 Mar 81).....	3
Logging in Washpool Forest Is Political Timebomb for NSW (Joseph Glascott; THE SYDNEY MORNING HERALD, 14 Mar 81).....	4
NSW, SA Governments Row Over Murray River Salinity (THE AUSTRALIAN, 17 Mar 81, THE WEST AUSTRALIAN, 9 Mar 81).....	6
Exchange of Accusations, by Peter Blunden Effect of Salt	
New Coordinated Study of Soil Problems in WA Projected (THE WEST AUSTRALIAN, 20 Mar 81).....	8
Briefs	
Botany Bay Study	10
Unions Against Development	10

HONGKONG

- Agency Formed To Coordinate Environmental Policy
(V. G. Kuikarni; BUSINESS TIMES, 25 Feb 81)..... 11

MALAYSIA

- Denial That Environmental Pollution Has Reached Crisis Stage
(BUSINESS TIMES, 19 Feb 81)..... 12
- Use of Specialized Bacteria To Treat Effluent
(BUSINESS TIMES, 20 Feb 81)..... 13

NEW ZEALAND

- Environmental Group Plans 'More Political Approach'
(THE NEW ZEALAND HERALD, 10 Mar 81)..... 14
- Effects of Mining Operations on Environment Disputed
(Various sources, various dates)..... 15
- Forest, River Damage, by Michael Field
Damage Bonds Planned
Opencast 'Lakes' Hit
Lobbying Action Begun
Bonding of Multinationals
Government Backs Mining
- Social Impact of Expanded Forest Industry Stressed
(THE EVENING POST, 10 Mar 81)..... 20
- Briefs
Environmental Laws Book 21
Save Rivers Campaign 21
Herbicide Use Survey 21

PEOPLE'S REPUBLIC OF CHINA

- Suzhou 'Three Wastes' Management Research Encouraging
(Cao Lianfu; GUANGMING RIBAO, 15 Mar 81)..... 22
- Anshan Completes Pollution Control Projects
(Xiao Han; GUANGMING RIBAO, 15 Mar 81)..... 24
- Environmental Protection Urged During Readjustment Period
(GUANGMING RIBAO, 15 Mar 81)..... 25
- Environmental Science Areas of Study Discussed
(Ke Huan; HUANJING BAOHU, No 6, 1980)..... 27
- Atmospheric Pollution in Beijing Analyzed
(Tai Qisheng; HUANJING BAOHU, No 6, 1980)..... 32

Measures To Prevent Desertification Proposed (Ma Wenyuan; HUANJING BAOHU, No 6, 1980).....	35
Methods of Producing Biogas for Fuel Described (Zhao Dianwu, Yu Wentao; HUANJING BAOHU, No 6, 1980).....	38
Desulfurization, Decyanation Technique Developed (Xu Changsong; HUANJING BAOHU, No 6, 1980).....	44

PHILIPPINES

Foreign Firms May Join in Reforestation (BULLETIN TODAY, 29 Mar 81).....	50
---	----

SRI LANKA

Logging Operations Prohibited in Sinharaja Forest (T. B. Peramunetilleke; BUSINESS TIMES, 23 Feb 81).....	51
--	----

EASTERN EUROPE

POLAND

Environmental Protection, Ecological Degradation Problems Reported (AURA, Feb 81, SLOWO POWSZECHNE, 20-22 Mar 81).....	52
Environmental Protection Lag Reported Scientists Alarmed Over Ecological Degradation	

NEAR EAST AND NORTH AFRICA

IRAQ

Marine Environmental Protection Committee Established (AL-THAWRAH, 6 Mar 81).....	56
--	----

JORDAN

Campaign Planned To Fight Insects, Rodents in Amman (AL-DUSTUR, 16 Mar 81).....	57
--	----

PERSIAN GULF AREA

Funds Allocated To Fight Pollution (ARAB TIMES, 19 Mar 81).....	58
--	----

SUB-SAHARAN AFRICA

BOTSWANA

Serious Flooding Likely To Cripple KRDA (DAILY NEWS, 13 Mar 81).....	59
---	----

MALAWI

Briefs	
Drought Reported	60
Floods Destroy Crops, Houses	60

NIGERIA

Floods Said To Cover 700,000 Hectares Yearly (NEW NIGERIAN, 31 Mar 81).....	61
--	----

AMBIA

Briefs	
Ndola Pollution 'Health Hazard'	62

ZIMBABWE

Scientists Slam DDT Pollution Claims (Mafuba; THE HERALD, 15 Apr 81).....	63
--	----

USSR

Militia Assists in Nature Conservation (V. Volchenko; LITERATURNAYA GAZETA, 8 Oct 80).....	64
---	----

Military Procurator Explains Conservation Objectives (A. Polonskiy; KRASNAYA ZVEZDA, 5 Feb 81).....	65
--	----

Water Conservation Decree Promulgated by USSR Council of Ministers (SOBRANIYE POSTANOVLENIY PRAVITEL'STVA SSSR, No 25, 1980).....	67
--	----

Briefs	
Man-Made Sea	70
Earthquake in Mountains	70
Coastline Reinforcement Center	70
Aftershocks Felt	70
Rebirth of a River	71
Sewage Treatment	71
Earthquakes in Resort	71
Run-Off Control	71
Earthquake Near Dushanbe	71
Far East Volcano	72
Conference on Geography and Agriculture	72
Clean Air Control	72

WEST EUROPE

INTERNATIONAL AFFAIRS

Sweden Officially Protests Danish Power Plant Plan (Johannes Bundgard, Peter Kjelstrup; BERLINGSKE TIDENDE, 13 Feb 81).....	74
---	----

DENMARK

Environment Agency Searches for Chemical Dump Sites (Michael Rastrup Smith; BERLINGSKE TIDENDE, 18 Feb 81).....	76
Eradication of Deciduous Trees To Damage Forest Ecology (Bent Soby Madsen; INFORMATION, 20 Feb 81).....	78

FINLAND

Professor Aims Biological Substances Used in Farming (Eero Varis; UUSI SUOMI, 18 Feb 81).....	83
Country's First Hazardous Waste Facility Planned (Juhani Virkki; SUOMEN KUVALEHTI, 20 Feb 81).....	87
Briefs Hazardous Waste Site Decided	91

GREECE

Athens Municipality Assumes Anti-Pollution Campaign (D. Geroukalis Interview; TA NEA, 23 Mar 81).....	92
Revision of Earthquake Resistance Code Suggested (I KATHIMERINI, 11 Mar 81).....	96

BALTIC SEA ENVIRONMENT COMMISSION WORRIED OVER PESTICIDES

Helsinki UUSI SUOMI in Finnish 19 Feb 81 p 7

[Article: "Protection Commission: A Basis for Evaluations of the Baltic"]

[Text] The general conclusions arrived at on the basis of an extensive evaluation of the effect of pollution on the natural resources of the Baltic were endorsed at the Baltic [Environmental] Protection Commission conference in Helsinki on Wednesday.

Prof Hans Luther, a member of the Finnish delegation participating in the conference, said that the best possible background material for evaluations of the condition of the Baltic, which will form the basis for constant evaluations to be made at different intervals, has now been obtained.

The Protection Commission has decided to appoint a group which is to come up with a proposal as to what intervals should be specified to jointly investigate the different factors that affect the condition of the Baltic. Luther said that this group will meet in Helsinki next September.

The general conclusions arrived at on the basis of the evaluation and which the Protection Commission has now endorsed will be presented as a position paper for those changes which, it has been ascertained, must be made in the maritime environment of the Baltic during this century.

The evaluation also deals with environmental pollutants in the Baltic. Among others, DDT and PCB compounds as well as certain heavy metals, concentration levels of which in the sea have been measured and are rising, have proven to be a matter of great concern. It has been observed that DDT [as published] and mercury levels have been dropping to some extent.

Among other things, the evaluation also indicates that the sea is being polluted by materials introduced from the land and the luxuriant growth they give rise to.

Luther said that the Protection Commission decided on Wednesday to send a recommendation to the Baltic coast nations in which they would be asked to consider the evaluation of the state of affairs that has now been presented. The commission conference came to an end on Thursday.

11,466
C30: 5000

BALTIC ENVIRONMENT GROUP AGREES ON HAZARDOUS CARGO STUDY

Helsinki UUSI SUOMI in Finnish 20 Feb 81 p 8

[Article: "Protection Commission Has Decided on Some 10 Recommendations for the Baltic"]

[Text] The Baltic Protection Commission concluded its 4-day conference Thursday with the endorsement of several recommendations. Among other things, they concern the safety of ships plying the Baltic with hazardous cargo aboard and the barring of ships that may be responsible for pollution hazards.

The 4-day conference produced all told some 10 recommendations. The commission also endorsed general conclusions arrived at on the basis of an extensive evaluation of the effect of pollution on the natural resources of the Baltic and recommended that the governments of the Baltic coast nations carefully familiarize themselves with the evaluation.

The evaluation considers DDT and PCB compounds, among others, as well as certain heavy metals to be the most hazardous of the harmful materials found in the Baltic. It also warns against those pollutants introduced from the land, which multiply in the sea.

"Concentrations of phosphorous in one of the most essential plant nutrients have been on the rise in the Baltic over the past 15 years," Protection Commission chief secretary Prof Aarno Voipio warns. According to him, all Baltic coast nations must make an effort to reduce the volume of nutrients that get into the sea.

According to him, Finland and Sweden are fairly far advanced in the elimination of these nutrients.

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SECRET IMPORTS OF AGENT ORANGE SUSPECTED IN BIRTH DEFECTS INCREASE

Canberra THE AUSTRALIAN in English 24 Mar 81 p 3

[Article by Nicholas Rothwell and Wio Joustra]

[Text]

A GROUP of scientists claim that an alarming rise in birth defects may be linked to the use of hundreds of tonnes of a dangerous chemical preparation, Agent Orange, which they suspect was secretly imported.

They have found an 84 per cent rise in the incidence of the degenerative disease spina bifida in young children in the four years from 1968 to 1972.

Also, they found an increase of more than 68 per cent in urinary tract infections in children in the same years.

The period covers the time the scientists suspect the imports of Agent Orange occurred.

Agent Orange is the name given to a toxic defoliant used in the Vietnam War. Its active ingredient is the chemical 2,4,5-T, which contains the dioxin molecule, one of the most potent poisons ever

made. Its civilian use was as a herbicide and pesticide.

A former member of the Ranger Commission Inquiry, Professor Charles Kerr, who with his colleagues has been conducting research into Agent Orange, has raised questions about government classification of the suspected imports, which appear to have been falsely described in official records.

The controversial research, first reported in *The Australian* yesterday, was carried out by Professor Kerr, Dr Barbara Field of the Commonwealth Institute of Health, and two Australian National University experts, Dr Peter Hall and Dr Ben Selinger.

Dr Hall and Dr Selinger will publish a paper next month giving details of their survey of birth defects occurring in the years 1968 to 1972.

Spina bifida and urinary tract infections have not been linked before with environmental factors.

CSO: 5000

LOGGING IN WASHPOOL FOREST IS POLITICAL TIMEBOMB FOR NSW

Sydney THE SYDNEY MORNING HERALD in English 14 Mar 81 p 43

[Article by Joseph Glascott]

[Excerpt] In this election year, the Wran Government must negotiate the dangerous pathways of the Washpool forest on the North Coast. It must play off the environmentalists against the timber millers, who threaten unemployment in Don Day's electorate of Casino if logging of the rainforest does not go ahead. The Government pushed through the Cumberland Oval stadium project against conservation opposition. Now, Cabinet may feel it's time to make a concession to its conservation supporters. Joseph Glascott reports on how the reverberations of the Cumberland Oval may be heard in the Washpool forest.

It is not easy to be a conservationist in Grafton, the centre of the North Coast timber industry.

A small group of locals who last year formed a Clarence River branch of the National Parks Association have found themselves thrust into a bitter controversy over proposals by the NSW Forestry Commission and sawmillers to log the Washpool rainforests.

Opposition to the logging plans by the conservationists has created a menacing atmosphere in this pretty town of 17,000 people with its stilt houses and jacaranda trees.

Angry confrontations with sawmillers and half-veiled threats have made the band of conservationists feel ostracised in their own community. William Faulkner scenes of the Deep South come to mind in this town of divided loyalties.

The proposed logging of Washpool and its magnificent rainforest stands as the next major environmental issue facing the State Government. It is fraught with difficult political decisions for the Government.

Stirred by the blocking of its plans to log the Terania Creek forest near Lismore by a long-drawn-out inquiry, the timber industry has mounted a heavy campaign to win Government approval to log in Washpool.

The main weapon it is using is the threat of unemployment to timber workers. The Labor Government is obviously vulnerable on this question. The Casino seat of the Minister for Industrial Development and Decentralisation, Mr Don Day, will be at risk if the decision goes against the timber industry.

But how far can the Wran Government go in putting off-side the environmentalists, who have been one of its main support groups? Having steam-rolled the Cumberland Oval stadium project in historic Parramatta Park, against conservation opposition and departmental advice, and refusing a public inquiry, Cabinet may feel it is time to make a concession to its conservation supporters.

CSO: 5000

NSW, SA GOVERNMENTS ROW OVER MURRAY RIVER SALINITY

Exchange of Accusations

Canberra THE AUSTRALIAN in English 17 Mar 81 p 2

[Article by Peter Blunden]

[Text] A row between the NSW and South Australian governments over high levels of water salinity has intensified following claims that a big design flaw in a country water storage system is endangering the health of thousands of people.

The NSW Opposition's spokesman on water resources, Mr Tim Fischer, believes that not enough provision has been made for water flow through the Menindee Lakes on the Darling River, leading to the accumulation of stale and highly saline water.

As a result, he believes a serious threat has been posed to all irrigators downstream and the health of people from Mildura to Adelaide endangered.

Unless urgent action is taken, the Darling's waters could become unfit for drinking, Mr Fischer said.

The South Australian Premier, Mr Tonkin, said later that despite many protests the NSW Government was still "totally devoid of any sense of responsibility" in this area.

He called for a complete halt to further irrigation development in the Murray-Darling river system.

The water crisis is a politically sensitive one in South Australia where the State Government recently revealed plans to spend an extra \$50 million in the next three years to beat the salinity problem.

Appeals by the South Australian Government against new irrigation licences being granted in the river's upper reaches in NSW are subject to a Supreme Court hearing.

Figures show that Adelaide's water now has a typical salinity level of 400 parts per million (more than four times the level in Sydney and eight times higher than in Melbourne).

On occasions, salinity levels in South Australia's stretch of the Murray have soared above 1000 parts per million, twice the level set by the World Health Organisation as acceptable for drinking.

Redesign

The row was revived when Mr Fischer said the Menindee Lakes system, about 110km south-east of Broken Hill, would have to be redesigned to allow the complete flushing of the lakes in any large flood.

This would allow the saline and stale water to be flushed downstream, diluted by the floodwater.

Mr Tonkin reacted to the claims immediately, agreeing that the Menindee problem would have to be countered quickly.

But he added that this did not pose the only critical problem.

"The most important point is that every time additional water is diverted upstream for irrigation it increases salinity problems downstream," he said.

Mr Tonkin accused the NSW Government of pressing ahead with further irrigation development "without regard for the impact on fellow Australians."

"South Australia is on the end of the run and the only thing we seem to be able to do is plead for a sensible appreciation of the problem by the States upstream," he said.

Effect of Salt

Perth THE WEST AUSTRALIAN in English 9 Mar 81 p 13

[Text] Adelaide: The River Murray had stopped flowing into the sea and could be dead in 15 years, the director of the Murray Valley Development and Conservation League, Mr J. Proud, said yesterday.

The river was now virtually land-locked.

Salt was building up at such a rate that the river might not be of any use to anyone within 15 years.

The Murray was carrying about 1 million tonnes of salt into South Australia every year.

Instead of being flushed out into the sea, the salt was deposited in SA because of the silting-up of the river.

CSO: 5000

NEW COORDINATED STUDY OF SOIL PROBLEMS IN WA PROJECTED

Perth THE WEST AUSTRALIAN in English 20 Mar 81 p 12

[Text] A team of senior government officers and other experts will coordinate a programme aimed at combating soil erosion and salinity in WA.

The move is part of a government plan to streamline the organisation and operation of all groups doing research and field work on these problems.

The Government will also review the Soil Conservation Act to see whether it should be strengthened.

In its election-policy speech the Government pledged that it would try to bring salinity under firm management control.

The main aim would be to maintain or increase beneficial development while protecting farmlands and water supplies from salinity.

The Premier, Sir Charles Court, said yesterday that the Commissioner of Soil Conservation would have an important role in the programme.

Senior officers from the Agriculture, Works and Water Resources, Lands and Forests and Conservation and the Environment Departments would be included in the new organisation as well as people from the private sector.

A ministerial committee would supervise the group's activities.

Early Tasks

One of the early tasks would be to clarify what extra funds were needed and how they could be provided, Sir Charles said.

The funds might need to come from the Federal and State governments and the private sector.

Taxation incentives could have a vital role.

Sir Charles said in a news release that he hoped the new organisation would be operating soon.

There would be early consultation with organisations such as the Pastoralists and Graziers' Association and the Primary Industry Association.

There was no single or simple solution to the problems of soil erosion, salinity and soil degradation.

Much would depend on education programmes and cooperation.

"Some of the prejudices of the past will have to be broken down and the revised organisation will be more concerned about finding out what is right rather than who is right," Sir Charles said.

"There is no room for personal jealousies, bickerings or prejudices in favour of or against any particular system."

Sir Charles said that on Monday the Cabinet would consider recommendations from a ministerial committee which he headed.

Much research and work had been done in farmlands and the Darling Range region.

The aim was to ensure that research and practical experience by departments, farmers and others were put to good use.

There had been a tendency to think that mining problems in the Darling Range were separate from those arising from farming and the operations of other industry.

Sir Charles said that the Commissioner of Soil Conservation, Mr G. W. Spencer, was relinquishing the position because of ill-health.

His successor would be appointed in the next few weeks.

CSO: 5000

BRIEFS

BOTANY BAY STUDY--Port developments at Botany Bay have destroyed large areas of foreshore essential for fish and birdlife, an environmental study said yesterday. It calls for better environmental protection and conservation measures at Sydney's second port, which was officially opened in 1979 and is designed to handle the mammoth container ships and tankers too big for Sydney Harbour. The environmental study was carried out by the State Pollution Control Commission and the Maritime Services Board and took five years to complete. Among its 43 recommendations, the study calls for: Foreshore reserves with boat ramps and picnic spots and better conservation measures. A nature reserve at Towra Point. Urgent measures to decrease the threat of oil spill. Protection of bird and fish habitats in wetlands and seagrass beds. But the study supports the State Government's decision to begin the Botany Bay port development. The area was the only practicable location between Port Kembla and Newcastle. [Excerpt] [Sydney THE SYDNEY MORNING HERALD in English 24 Mar 81 p 3]

UNIONS AGAINST DEVELOPMENT--Surfers Paradise--Gold Coast unions have joined the campaign against high-rise development. The Gold Coast Trades and Labor Council has imposed green bans on any attempt to build skyscrapers at the Southport Broadwater and on Burleigh Headland. Other unions have indicated they will follow. Affiliated unions will refuse to work on highrise construction in the two areas. More than 2000 people marched through Southport streets to protest about a proposed development at the Broadwater. Rallies to stop proposed highrise on Burleigh Headland, one of the Gold Coast's last remaining fauna and flora sanctuaries, also have been well attended. The Trades and Labour Council ban on the highrises will affect 22 unions. [Text] [Brisbane THE COURIER-MAIL in English 20 Mar 81 p 2]

CSO: 5000

AGENCY FORMED TO COORDINATE ENVIRONMENTAL POLICY

Kuala Lumpur BUSINESS TIMES in English 25 Feb 81 p 6

[Article by V.G. Kulkarni in Hongkong]

[Text]

ENVIRONMENTAL protection has long been on the back burner of official priorities here. However, the government has taken the first — but critics say a belated — step in that direction due to the crush of industrialisation in the colony.

A newly created body called the Environmental Protection Agency (EPA) is to assume a co-ordinating role in making environmental policies. Until now, the government's Environment Branch, which is an umbrella organisation to oversee transport and land matters, looked after problems arising out of air, water and noise pollution. A small environmental protection unit was set up in 1976 to assist the umbrella body, out of which the new EPA is born.

The EPA's responsibilities are:

- Formulating policies on all matters of environmental protection.
- Overseeing and co-ordinating improvements in environment.
- Monitoring pollution levels.
- Carrying out research in assessing the environmental impact of developmental projects

such as power stations, industrial estates and public works.

■ Acting as a consultant to other governmental departments on matters related to environment.

■ Training staff in control and supervisory roles.

The outlay on environment is to be increased four-fold from the present US\$1 million to US\$4 million, according to EPA Commissioner Stuart Reed, who was the environmental protection adviser in recent years.

The pollution control staff whose numbers have risen from a mere 10 in 1976 to the current level of 60, will grow to 88 by 1983-84. Dr Reed, who has borne the brunt of criticism from conservationists in recent years, said: "We have been setting up legislation for the past couple of years. Now we have got the staff and equipment posted and are starting to put the flesh on the bones of legislation."

Critics point out that it has taken "a couple of years" for the government merely to legislate the body into effect and it might take some years before the staff is trained

and control functions become effective.

Dr Reed responded that detailed legislation on environmental standards was being developed and "when we have this we will have inspectors to go and implement the legislation."

"In a year's time we will have units for noise and vibration control, agricultural waste control, liquid effluent control and solid waste control. The air pollution control will be strengthened," he said.

Dr Reed also pointed out that the new agency's capacity to do its own research and development rather than depending on foreign standards is a big step forward. He added that the government had already bought HK\$2 million (US\$266,000) worth of monitoring equipment.

Although the new agency envisages several control units in other departments, their effectiveness remains in doubt. Currently, departments like public works, agriculture and fisheries, marine, urban services and the police have enforcement responsibilities. As the new control units will come under these same de-

partments, the major concerns of these departments, rather than environment ones, will have an overriding effect.

Moreover, the new agency will report to the Environment Branch, which deals in other more immediate matters — in terms of its priorities — like transport and land policies. Land and transport are subjects that concern billions of dollars to be made by private entrepreneurs as well as government. In case a divergence of interest between these and environmental protection exists, critics believe, dollars and cents will speak louder.

The concern of environmentalists was voiced by Wan Shek-luen, the chairman of the Conservancy Association, a private body. He said: "It is merely a data collecting agency which has no decision-making powers. All policies will be decided by the Environment Branch."

How vigorously Dr Reed's new agency proceeds against vested interests, will decide the effectiveness of environmental control in Hong Kong. — Depthnews

DENIAL THAT ENVIRONMENTAL POLLUTION HAS REACHED CRISIS STAGE

Kuala Lumpur BUSINESS TIMES in English 19 Feb 81 pp 1, 20

[Excerpts]

THE Director-General of Environment, Mr S.T. Sundram, denied that pollution of the Malaysian environment has reached crisis proportions or that lack of effective action on the part of the relevant authorities has led to the alleged crisis. He said this in rebuttal to an article that appeared in a foreign magazine.

The *New Scientist* of London in its Sept. 4 issue carried a lead article entitled *The Fight to save Malaysia* with a cover caption which read *Malaysia — See it while it lasts*. A suitable reply has been sent to the magazine, Mr Sundram said.

He did not deny however that serious environmental problems exist. The environmental problems Malaysia faces today are the result of neglect at federal, state and private sector levels. Most of the damage could have been avoided if measures had been taken at initial planning stages, he said.

Among the measures that should have been taken are suitable loca-

tion of activities, impact assessment of polluting projects and the control of effluent discharge and emissions from industries.

The Environment Division's approach for the 1980s will give emphasis to integrating environmental protection measures into development planning.

While continuing with this, the division will channel its efforts increasingly into the development of new methodologies such as environmental impact assessment, environmental information system, cost benefit analysis, criteria for resource use and conservation and alternative patterns of development and life styles that are in harmony with the environment.

In line with the new approach for the '80s, the division has evolved a comprehensive environmental management programme which includes resource management and ecosystem preservation, research into land use management, ecosystem conservation, pollution monitoring, environmental pollution control, contingency plan

to combat oil pollution, dispersal of industries, environmental impact assessment and environmental education.

By 1985, rubber and oil palm industries together will generate a combined biochemical oxygen demand load equivalent to domestic sewage from a population of 15 million. This is significant, considering that the effluent discharge from these two industries is already affecting some 25 rivers throughout the country some of which are sources of water supply.

Mr Sundram said a study undertaken by the Balfour consultants indicated that the total load of non-organic toxic substances entering the Klang River from industrial estates in the Klang Valley amounted to nearly 8,000 pounds per day.

The rapid rate of deforestation is intensifying the problem of soil erosion and silting of the rivers, he said. Tin mining activities have contributed to the problem by adding a high load of suspended silt and adversely affecting the quality of water at supply intake points.

USE OF SPECIALIZED BACTERIA TO TREAT EFFLUENT

Kuala Lumpur BUSINESS TIMES in English 20 Feb 81 p 3

[Text]

MALAYSIAN palm oil and rubber mills are facing problems in the biodegradation of effluents using normal bacteria. However, this process can be accelerated through the injection of "specialised" bacteria which will augment existing bacteria to treat industrial waste more efficiently.

Mr Chen Yew Seng, managing director of CSC Kemico (SEA) Sdn Bhd, said this at a seminar on ion exchange update 1981: ion exchange in cane sugar purification which was held yesterday.

The seminar was conducted by Mr John Ungar, international manager for the Ionac and Biochemical Divisions of Sybron Corporation chemical group (USA).

Developed by the biochemical division of Sybron, "biochem bacteria" are non-toxic and are capable of "degrading" toxic industrial compounds which normally destroy ordinary bacteria.

These stronger bacteria can be used in municipal and industrial waste treatment where effluents which were normally non-biodegradable would cause problems to waste treatment systems and would require complete system redesign and considerable capital outlay.

Bacterial augmentation is a relatively new concept here and experiments are still being carried out to determine which applications would be most cost-effective and give optimum benefits such as reducing pollution levels in rivers which accept effluent discharges.

The seminar, organised jointly by CSC Kemico and Sybron Corporation (USA), provided an overview of ion-exchange, used mainly for the purification of industrial water for the power generation facilities, and the semi-conductor and electrical. (The process is also used for other non-water applications such as in sugar purification and the extraction of minerals.)

The application of ion-exchange for the purification of sugar was given special emphasis, since seminar participants mainly represented the local sugar refineries, namely Malayan Sugar Manufacturer (Prai), Syarikat Gula Padang Terap and Syarikat Gula Perak.

Ion-exchange was used in the sugar purification process here more than 10 years ago, and the local manufacturers have since adopted this method over the traditional methods such as using charcoal.

ENVIRONMENTAL GROUP PLANS 'MORE POLITICAL APPROACH'

Auckland THE NEW ZEALAND HERALD in English 10 Mar 81 p 14

[Text]

Press Assn Blenheim

Friends of the Earth is to adopt "a more political approach" this year and will concentrate on opposing the addition of lead to petrol.

The national organiser, Mr Roger Wilson, reported after a conference that the environmental group would also focus attention on mining, the future of the Antarctic and logging during the run-up to the election.

The group would bring an

Australian to New Zealand in June to address meetings and a seminar on lead in petrol, he said.

The group's organiser, Mr John Horrocks, said New Zealand was planning to add lead to the Taranaki synthetic fuel plant petrol — which in the United States would qualify as lead-free — to increase its octane rating.

This would be costly and lead to "amazing hazards" when the lead was absorbed through the skin.

'Manipulated'

Australia was heading towards lead-free petrol, he said, and New Zealand's stance was "absolutely absurd."

Mr Wilson claimed that New Zealand was being manipulated by overseas interests because it depended on the International Monetary Fund and the World Bank.

He criticised the suggestion, floated by the Minister for the Environment, Dr Shearer, of a 2 per cent wildlife levy on the capital cost of big projects as "dangerously like a clumsy attempt to buy off the environmental movement."

Big projects could damage more than just wildlife, he said, and in many cases 2 per cent would not come anywhere near the cost of restoring the environment.

Development Act

The conference heard that the Save Aramoana campaign was preparing to fight the proposed second smelter in the courts.

A spokesman, Mr Alan Cumming, said he was expecting an application for the National Development Act to be applied to be filed next week and was prepared for such an event.

If all legal channels had to

be used it was estimated that about \$100,000 would have to be raised.

Mr Cumming said the second smelter was often seen as a single issue, but there were many reasons why it was not wanted — affecting electricity, the economy and homes.

An environmentally sensitive area was at stake, and there was concern about pollution spreading into Dunedin.

He said the two smelters, including extensions at Tiwai Pt, would use 32 per cent of New Zealand's power.

A forestry researcher, Janet Stephenson, told the conference she favoured forestry but on a small scale and with individual ownership.

In the hands of present planners, she said, it seemed to follow logically that big forests must be processed in big mills.

EFFECTS OF MINING OPERATIONS ON ENVIRONMENT DISPUTED

Forest, River Damage

Wellington THE EVENING POST in English 7 Mar 81 p 14

[Article by energy reporter Michael Field]

[ext]

THERE is an endangered species on the West Coast and the outspoken rustic souls who live there are not at all concerned.

"We've got a big enough hole over here to bury them all," an old Reefton man said as he stood outside a hundred-year-old building that once housed the "School of Mines".

He probably meant it too, as folks on the coast are not overly fond of the species: environmentalists, ecologists, greenies, or, as some would have them, "the hippies".

It is fruitful territory for mining companies to work in, as a genial Italian geologist is finding. Dr Franco Pirajno is the manager of Gold Mines of New Zealand, a company 92 percent owned by South Africa's Anglo American Corporation ("the world's largest mining company"), with Wellington's slightly less humble concern, Brierley Investments Ltd, owning the balance.

Anglo has been in New Zealand for six years but has only recently come to public attention in the debate about mining on the Coromandel - the heartland of alternative lifestyle followers.

Anglo didn't like the flak, so it went on the offensive with a public relations budget that would keep Coromandel herb gardeners in organic fertiliser for a couple of millennia.

A similar campaign was launched in Australia by taking a team of editors to Johannesburg to look at big time gold mining, and then flying them on to London in the company's executive jet.

This month, Anglo flew 14 New Zealand journalists to the West Coast with a clear expense-is-to-be-no-object attitude. Costly helicopter rides into wild bush country were part of the package.

A couple of lower-budget companies, L and M and Kanieri Gold Dredging, also used the opportunity to sell their line to the press.

Dr Pirajno complains that protesters will not listen to miners, and it annoys him all the more as he says he is as appreciative of the environment as anybody who lives in the wilds practically fulltime.

He is interested in balances and trade-offs and knows full well that most people don't want the alternative lifestyle of the Coromandel elite. And he sees a double standard in their position, pointing to a public meeting the company held on the Coromandel.

"The environmentalists all came to the meeting in cars," he said. "Now if you drive a car, you are a slave of the mining industry."

Dr Pirajno says protesters do not scare the company and it wants to operate in New Zealand.

"New Zealand is particularly attractive to the company. First, be-

cause of the political stability here and second, because of the geological structures."

The protests currently going on over mining indicate to Dr Pirajno an apathy in New Zealand about the role of mining.

"The public here is just not aware of the dependence of the world on mining products. Mining forms the basis of our civilisation."

Near Reefton, Anglo has found traces of a range of minerals, and preliminary drilling is under way to determine the extent of the deposits. Reefton people would see no problem with mining but the fact is that any economic discovery would be made in the middle of a beautiful native beech forest-clad mountain splendour.

The problem this would pose was embarrassingly illustrated to the press by Anglo. The two helicopters it provided to fly into the Brunner Range flew low over the State Coal Mine's Garvey Creek opencast coal mine on top of a sharp ridge. When the mine was opened, the overburden (the earth covering the coal) was simply tipped over the side of the mountain. This has left a long line of dead trees right down to a river bank. The river has also suffered and restoration of the site will be virtually impossible.

A mine expert travelling with the press said he had once discussed this with Garvey officials who, he said,

had replied that it did not matter as nobody would see it.

Poetic justice perhaps that 14 reporters and photographers should end up flying over it — in another mining company's helicopter.

Anglo officials say they would not act in such a way and point to their own land restoration programme in South Africa.

But the Transvaal veld is hardly the same as the remote native bush country that Anglo took reporters into. Dr Pirajno and his team of explorers are conscious of this, and they admitted to agreeing with many of the environmentalists' points — but the problem is that they merely represent the front end of the mining company. The people who make the decision on whether to mine the Brunner probably have never seen — nor ever will see — wild blue ducks in their natural West Coast setting.

In a roundabout way, Dr Pirajno admitted this by relating his own experience of having discovered a major mineral deposit on the Zimbabwe-Botswana border years ago. He left the wilderness after making the find and other Anglo staff made the decision to go in and mine.

Dr Pirajno, through his find, contributed to a major environmental change in Southern Africa. He did not, however, even have the satisfaction of getting a cut from the wealth he discovered for his employers.

"If I'd got a cut, I would be in Hawaii today — not in Reefion. My reward is the publication of a paper in the Journal of Geology."

Anglo, through Dr Pirajno, comes across with a concluding message over the impact of mining on the environment. However, two other companies which operate on the coast take a different attitude. This was particularly so with the wholly American-owned Kanieri Gold Dredging Company and its general manager, Mr Kevin Buckley.

His company is setting up a \$20 million project on the Grey River to dredge for alluvial gold — a project many local farmers are opposed to. Mr Buckley claims the company will restore the river bed — but until recently Kanieri had a poor track record. Its 40-year operation on the Taramakau River has left acres of ugly and useless tailings.

Only recently has it begun restoration, although the word is wrong in the context; it is land change. It

does not turn the land back into river bed as it was originally; it turns it into marginal pasture land. And the once meandering river is confined to a fast flowing narrow channel.

And it is this that the opponents dislike; they don't want the pasture, they want a truly wild river with all the recreational advantages it offers. A gold dredge removes the advantages.

Near the Taramakau River dredge the Transport Nelson-owned company, Lime and Marble Ltd, operates a small dredge and restores the land as it goes. Admittedly, the pasture produced is more attractive than the tailings such dredges once left behind.

L & M's general manager, Mr Jock Braithwaite, says his company makes every effort to neutralise any damage.

"The miners in the past made a lot of mistakes," he says, "but so did everybody else. We're responsible citizens and we're doing restoration because we want to, not because of a crowd of people with placards."

That, of course, is debatable. The environmental movement has played a large part in developing a more sensitive approach and it is doubtful that mining companies would make the effort otherwise.

Damage Bonds Planned

Auckland THE NEW ZEALAND HERALD in English 12 Mar 81 p 1

[Excerpts] Te Aroha--The Government will impose bonds on some mining companies to help to pay for any damage caused by their operations.

In a letter presented at a meeting of the Hauraki Catchment Board yesterday, the Minister of Energy, Mr Birch, said that he would impose a bond condition on any mining licence granted for "a significant mining operation."

Mr Birch said that under such a condition the licence holder would have to provide a bond "sufficient to meet any contingency which could reasonably be foreseen

to arise in the rehabilitation of the mined area."

However, Mr Birch's assurance received a mixed reception from the Hauraki board.

The chief executive officer, Mr R. W. Harris, said that while the bond may be "helpful" it would not "fix up the unfixable."

The executive officer of the Environmental Defence Society, Mr Gary Taylor, said last night that he would welcome the imposition of

bonds only "if they were related to the cost of rehabilitating an area, and not 'just a token amount.'"

Damage to sea resources as a result of mining in certain areas of the Coromandel Peninsula might amount to "millions of dollars," he said.

A spokesman for the Coromandel Peninsula Watchdog Organisation, Mr Peter Verschaffelt, said last night that Coromandel

people wanted a halt to the granting of large-scale prospecting licences until the Mining Act was changed. They did not want an imposition of bonds.

The Coromandel-Waihi area was a steep, high-rain-fall area which would be "largely impossible" to rehabilitate, he said.

Opencast 'Lakes' Hit

Auckland THE NEW ZEALAND HERALD in English 14 Mar 81 p 8

[Text] Waihi--Suggestions from mining officials that the deep pit resulting from possible opencast mining on Martha Hill could be made into an ornamental lake have upset a Waihi action group opposed to mining in the town.

They believe the pit could fill with contaminated water from underground mine workings and present a hazard to the town.

The viewpoint is supported by the deputy mayor, Mr M. A. Cowan, who raised the question with the Minister of Energy, Mr Birch, during his recent visit to the Martha Hill area.

Expert Study

Toxic run-off from the flooded pit would endanger the environment and public health, said Mr Cowan.

In a subsequent letter to the minister, Mr Cowan quoted from an open-pit mining study prepared by Mr A. B. Lovins containing the views of 14 qualified observers, including university professors, scientists and mining experts.

The report deals in part with the problem of huge pits created by opencast mining and lists several uses to which these areas could be put.

It states: "Ideas include flooding to form a recreational lake which may fall

foul of permeable rock, stagnant water or soluble materials. Seepage and run-off from the pit must be controlled for as long as they are toxic - perhaps a few centuries or so."

The minister has replied to Mr Cowan, requesting a copy of the Lovins report on open-pit mining.

View Challenged

Reports from the Amax company that assay results from diamond drilling on Martha Hill have shown positive deposits of gold and

silver have been hailed by mining supporters as good news for the country.

The viewpoint has been challenged by Mr G. E. Lee, National Party candidate for Hauraki, who says: "For mining to have any tangible benefit to the nation a practical royalty should be imposed on gold and silver as it is with oil."

"No such royalties are paid at present, although the current Mining Act provides for the minister to set such royalties."

Lobbying Action Begun

Auckland THE NEW ZEALAND HERALD in English 18 Mar 81 p 8

[Text]

Staff Reporter Tauranga

The Kaimai Action Group has begun lobbying Government ministers whose portfolios may be affected by gold prospecting in the Kaimai and Coromandel areas.

The group is asking the ministers to consider the effects that prospecting or mining could have on water resources, fisheries, forests and other areas of responsibility.

The group has also begun a study of water resources in the district and is compiling a dossier from reports of county councils, the water and soil conservation division of the Ministry of Works and Development, and the Bay of Plenty Catchment Commission.

The dossier will be presented to the Commission for the Environment for use in an environmental impact report.

Bonding of Multinationals

Christchurch THE PRESS in English 23 Mar 81 p 26

[Text]

PA

Auckland

Legislation proposed by the Labour Party's energy spokesman (Mr R. J. Tizard) would force multinational mining companies to put up a substantial bond as insurance against environmental damage.

Provision for the bond is included in a private member's bill which Mr Tizard intends to introduce early in this year's Parliamentary session.

Mr Tizard said that in view of the Government's intention to review the Mining Act, there should

be a moratorium on the issue of mining licences until Parliament had had a chance to change the law.

Of Labour's proposals, he said a workable system would need to include all types of mining throughout the country, with appeal procedures which gave due regard to both national and local interests.

Mr Tizard said his bill included provision for a full hearing to be held between the granting of prospecting and mining licences to ensure that all interest groups were given ample opportunity to air their views.

Some ministerial decision would also have to be argued in a court of law, which had heard all aspects of a case for a change of land use before any licence was issued.

A substantial deposit would be required from multinational mining companies to ensure reinstatement of land once mining had ceased.

Mr Tizard said that only Labour was offering the adequate safeguards and effective appeal procedures which could resolve the mining issue.

Government Backs Mining

Christchurch THE PRESS in English 23 Mar 81 p 20

[Text]

PA

Wellington

The Government wants the continued mining of minerals in New Zealand but with adequate environmental safeguards, according to the Minister of Energy, Mr Birch.

"A mining industry is essential in a modern society to provide materials need by manufacturers," he said. "A proper balance must be struck, however, between mining and environmental factors, especially in areas with a sensitive environment."

"A sound mining industry is also of benefit in providing opportunities for training in new skills and technologies."

Mr Birch said that he saw a need to encourage mineral exploration and prospecting as an industry in itself.

"Although the success rate for prospects to provide mines is very low it is important to foster an active industry so that a nation is aware of the resources available to it."

Of his recent visit to the Coromandel area, Mr Birch said it was important that the review of procedures for licensing requirements be completed as soon as possible.

Although basically the provisions of the mining legislation were sound some of the procedures which had been adopted in its administration needed to be incorporated into the law to give the public the assurance that rights of full participation were available at all stages of the licensing process.

He did not expect any proposals for substantial mining operations, whether by opencast or underground methods, for the Coromandel region to be put before the Government for some time yet.

From his observations a number of prospects were in the early stages of assessment but considerably more evaluation of these, particularly by diamond drilling, was needed before the companies concerned would be able to assess the potential of the prospect.

"Before any of these significant prospects are turned into mining operations the company proposing the mine development will have to prepare an environmental impact report for public comment," said Mr Birch.

If any application for a mining licence was received prior to the amending law coming into force he would arrange for a public hearing on the proposal so that conditions under which mining could proceed would be determined with the assistance of the local community.

"The Government will also carefully assess the economic aspects of any large-scale mining proposal, including both the local and national impacts, before any approval is given for the proposal to proceed."

Of the matter of bonding a licensee, Mr Birch said that the existing Mining Act already provided the opportunity for the Minister, in granting a mining privilege, to lay down such conditions as he thought fit and to

ensure that these were complied with. Properly supported financial bonds might be required of the licensee.

The New Zealand Mineral Exploration Association, representing all of the main mining companies active in New Zealand, shares Mr Birch's view that New Zealand needs a healthy exploration and mining industry, and welcomes the encouraged statement of support made by the Minister.

An industry spokesman, Bruce Utting, Secretary of the N.Z.M.E.A. said that the industry accepted the need for adequate environmental safeguards, consistent with the need to maintain a balance between conservation and exploitation. "At the moment, New Zealand has no base metal mining industry, and only a very small gold production," he said. "This situation could well change if the efforts of companies currently prospecting and wishing to prospect in New Zealand are successful, but the chances of success are low, and the risks high. Mining companies need all the encouragement and support they can get from Government if a continued flow of risk capital into mineral exploration is to be maintained."

SOCIAL IMPACT OF EXPANDED FOREST INDUSTRY STRESSED

Wellington THE EVENING POST in English 10 Mar 81 p 8

[Text]

The full social impact of New Zealand's rapidly expanding exotic forest industry is relatively unknown, the Environment Council has warned.

The warning was given in a background paper by the council to the 1981 New Zealand Forestry Conference taking place at Parliament.

The council produced the paper out of concern that amidst massive plans for the forest industry not enough was known about the effects of afforestation on people and communities.

"Even where some such impacts have been pinpointed, the almost total lack of accepted social goals makes decisions extremely difficult. Such fundamental alternatives as to whether people wish to live in the countryside or small towns, or in cities, are only vaguely stated, yet they must influence decisions being made today about tomorrow's processing options," the council submitted.

The council believed that it was in the export field that almost all future growth in the industry would occur — the domestic market being satisfied — and that there tended to be a push towards even bigger processing plants and the centralisation of facilities.

The greater the region's dependence on one item, such as forestry, the greater its vulnerability, the paper stated.

Also, the greater the reliance on one species, such as radiata pine which represented 85 percent of all present plantings and 92 percent of all new ones, the greater the risk to the plantation, production and employment.

The council urged that the full social costs and benefits of afforestation be given equal consideration with the economic aspects.

BRIEFS

ENVIRONMENTAL LAWS BOOK--The first book written on New Zealand environmental law is on sale. The 400-page, \$39.95 edition contains interpretation of laws relating to the environment and includes details of various court cases. It was written by an Auckland lawyer, Mr David Williams, a founding member of the Environmental Defence Society, and published by Butterworth of New Zealand. Butterworth's editor, Mr Peter Smailes, said most copies will probably go to town planners, local bodies and government departments. He said one of the most attractive features of the book was that it interpreted the recently passed National Development Act. [Text] [Wellington THE EVENING POST in English 13 Mar 81 p 13]

SAVE RIVERS CAMPAIGN--Greater public understanding is needed in the fight to save New Zealand's rivers, according to Professor K.S. O'Connor, professor of range management at the centre of environmental science, Lincoln College. Professor O'Connor was speaking to 70 people in a keynote address at the "Save the Rivers" conference at Victoria University. The conference was a joint venture from the New Zealand Canoeing Association, the Federated Mountain Clubs of New Zealand and the New Zealand Federation of Freshwater Anglers. It explored the dimensions and threats to New Zealand rivers, and sought agreement on protection measures needed. "There is an abundance of data and very little understanding," said Professor O'Connor. "There should be urgency in the campaign to save New Zealand rivers, but at the moment there seems to be a major problem in environmental perception," he said. [Text] [Wellington THE EVENING POST in English 30 Mar 81 p 14]

HERBICIDE USE SURVEY--Wellington (PA)--Applicators of the chemical spray 2,4,5-T, and their families have no greater incidence of congenital defects than the rest of the population, a medical survey has shown. The survey, sponsored by the Health Department and the Medical Research Council, compared rates of congenital defects, stillbirths, and miscarriages of the two groups. No significant differences were found, and the rates of congenital defects of 20 per 1000 births for chemical applicators and 16 per 1000 for agricultural contractors were close to those reported in other studies done in New Zealand, the researchers found. Eighty-six percent of 439 married chemical applicators and 422 married agricultural contractors responded to the survey. New Zealand is a big user of 2,4,5-T; more than 500 tonnes are sprayed each year. The survey found that the congenital defects were of no specific type. The researchers said that the results were reassuring, but that studies of bigger numbers with more specific data might disclose effects from use of the spray. [Excerpts] [Christchurch THE PRESS in English 31 Mar 81 p 1]

CSO: 5000

SUZHOU 'THREE WASTES' MANAGEMENT RESEARCH ENCOURAGING

Beijing GUANGMING RIBAO in Chinese 15 Mar 81 p 1

[Article by Cao Lianfu (2580 6647 1381): "City of Suzhou Achieves Encouraging Results in Scientific Research on Management of the 'Three Wastes'"]

[Text] Concurrent with its enforcement of environmental protection, the city of Suzhou is also actively developing scientific research to fight pollution. In fact, according to the written regulations, a portion of the pollution fines collected by the city are to be used in environmental research. After 1 year, the city has achieved encouraging results in its environmental research.

In a collaborative effort of the Suzhou Municipal Epidemic and Tuberculosis Hospital, the city's disease prevention stations, the Municipal Health Bureau and the first textile dyeing plant, a research project was undertaken to study the ozone purification of the bacteria-contaminated sewage from hospitals. The project succeeded after 1 and 1/2 years. After the purification with ozone, the rate of annihilating the intestinal disease-causing bacteria reached 99.99 percent, conforming to the national standard for pollutant discharge. Tests performed on the purification of the subtilin bacteria that replace the hepatitis virus show that the annihilation rate is 99.98 percent. All physical and chemical tests indicate marked improvement after the purification.

The artificial fiber board plant located in the suburb of Suzhou discharges 700 tons of sewage into Loujiang every day. Since this sewage contains a high content of organic material that consumes large quantities of oxygen and it also contains toxic chemicals such as ionized phenol, it causes severe pollution to the water body. With the assistance of the Wood Industry Institute of the Chinese Academy of Forestry Sciences, in less than a year this plant successfully developed a closed-cycle sewage circulation in the artificial fiber board technique and reduced the amount of chemically consumed oxygen in its discharged waste water by almost 80 percent. As a result of an improved material usage rate and the saving of the auxiliary materials, the cost of one cubic meter of artificial board has been reduced by more than 5 yuan. Evaluations show that this technique is simple to install, requires modest investment, is easy to operate and cheap to run. This practical method is an encouraging step forward for the waste water treatment in other Chinese plants making artificial fiber boards.

The third plastics plant located in downtown Suzhou makes soft polyvinyl chloride products. In the production process the evaporation of the plastics reinforcing

agent causes severe air pollution. The "three wastes" management group of this plant, with the assistance of the municipal disease-prevention stations and the environmental monitoring stations, successfully developed synthetic rubber air-purification towers to treat the waste gas. Measurements made on the purified air indicate that the concentration of the plastics reinforcing agent has dropped from the original 51.6 milligrams per cubic meter to a low level of 19.6 milligrams per cubic meter. Measurements taken at eight points in the nearby residential area show a concentration of only 0.49 milligrams per cubic meter. This has not only improved the working condition of the factory workers but also reduced the pollution of the atmosphere.

9698

CSO: 5000/4051

ANSHAN COMPLETES POLLUTION CONTROL PROJECTS

Beijing GUANGMING RIBAO in Chinese 15 Mar 81 p 1

[Article by Xiao Han (5135 1383): "City of Anshan Completes 59 Pollution Control Engineering Projects"]

[Text] During our national economic readjustment period the city of Anshan is emphasizing environmental protection work. It has completed 59 engineering projects for pollution control and has obtained good results in improving the environment.

In 1980 representatives of the Anshan Municipal People's Congress and members of the Political Consultative Conference made 4 visits to 66 enterprises and business units with serious pollution problems and made 110 criticisms and suggestions concerning environmental protection. The standing committee of the Anshan Municipal People's Congress discussed and passed a "Tentative Procedure for Assessing Pollution Fines" and collected pollution fines from 144 enterprises and business units. The Anshan General Chemical Plant, in order to pay less pollution fine, made a big push in July and worked feverishly for 20 days to complete a solvent de-phenol facility in the southern part of the plant and a modification of the biological de-phenol facility in the northern part. With these facilities they have increased the volume of waste water processed from the original 60 tons per hour to 250 tons per hour, and the purified water comes close to the national standard on phenol content per liter. At the first municipal chemical plant, the techniques have been improved and the management has been strengthened. The installation of a residual heat application facility has eliminated the need for one boiler, and saves 700 tons of coal and recovers 47 tons of oil and 27 tons of acid per year.

Both the environmental protection department and the construction department in Anshan are paying more attention to environment-related regulations to prevent the occurrence of new pollution sources. Among the 157 new construction, expansion, and modification engineering projects under evaluation at the environmental protection department, 56 projects involve pollutants, and they have all taken pollution control measures.

9698

CSO: 5000/4051

ENVIRONMENTAL PROTECTION URGED DURING READJUSTMENT PERIOD

Beijing GUANGMING RIBAO in Chinese 15 Mar 81 p 1

[Article by GUANGMING RIBAO commentator: "Strengthening Environmental Protection Work During Readjustment"]

[Text] At the present time environmental protection work is a very weak link that needs to be effectively strengthened through a positive attitude.

Environmental protection is not only an important issue in modernization but also a fundamental condition for the realization of the four modernizations. The mission of accomplishing modernization construction will encounter many difficulties if we do not have a good environment for people to live, work and learn in and a continuous supply of natural resources. More and more of our comrades have come to realize this point. The question now is how to handle the environmental protection work in the further readjustment of the national economy. This calls for some detailed analysis. Some pollution problems have a historical origin and require great sums of money to treat thoroughly. In the readjustment period we cannot put too much effort into this type of problem. There are also pollution problems that do not require too much money to treat and can be solved with a positive attitude and effective measures; these problems should not be ignored using readjustment as an excuse. Environmental protection regulations should be insisted upon in new construction projects so that we do not create any more pollution problems. Past experience has shown that in certain enterprises the problem is not the lack of a budget for pollution management but lack of attention and of a "positive attitude to convert hazards into resources" in the leadership. The waste of resources and energy in some enterprises today is at a shocking level. Over the years their investments have turned into the "three wastes" and have gone down the drain, but whenever anyone mentions the management of pollution they protest that it is beyond their ability. Why have not general exploitation facilities been built on the basis of scientific technology and management to reduce the discharge of the "three wastes" and to solve the waste problems? Then there are enterprises that spend tens or even hundreds of thousands of yuan paying for pollution damage but will not engage in pollution management. So the first problem to solve is one of recognition, and then we can put the important environmental protection work in its proper place and direct our conscientious efforts to attack it.

We should realize that economic readjustment has also brought many favorable conditions for environmental protection work. This is because inherent in the economic readjustment itself is the intention to strengthen the environmental protection work,

which has been unduly neglected; furthermore, the readjustment policies and measures also provide a guarantee and promotion of environmental work. For example, reducing the scale of capital construction will lead to more sensible planning of industries and place investments in the proper direction; organizing the capital construction projects currently underway will also have the benefit of insuring that the environmental protection regulations are followed. For those plants and factories that are severely polluting the environment and have no antipollution facilities and practices, the decision will have to be made to stop their construction. If an industry develops technical modifications centered on energy conservation, it will invariably benefit from both the energy saved and the pollution reduced. In the process of consolidating and reorganizing industries, those enterprises with backward production technology and serious pollution problems will be eliminated, and the number of polluting sources will thus be reduced. These readjustment policies are highly favorable to environmental protection work and we should take advantage of this opportunity to open further the environmental protection work and make some achievements.

During the readjustment period we should approach environmental work with an aggressive, realistic and pragmatic attitude. Priorities should be decided on and the most serious and hazardous problems solved first. For those problems that cannot be resolved right away, practical and systematic plans should be made so they can be attacked step by step as the years go by. The leading group on environmental protection in the State Council has made the necessary decisions to concentrate the efforts on some key cities. Particularly for the nation's capital, Beijing, we must thoroughly carry out the four suggestions made by the Central Committee Secretariat and take forceful measures to make noticeable changes in the capital's environmental appearance within a short period so that it can serve as an example for other cities in the nation. Special protection should be given to cities such as Suzhou, Hangzhou, and Guilin in order to preserve their characteristic scenic views. These cities are not only treasures of China but are world famous.

To a large degree the current pollution problems are caused by mismanagement; thus, the environmental management work must be greatly strengthened. The damage to the natural resources and the ecological equilibrium is often due to the lack of sound scientific planning, the lack of established legislation and regulation, not following the directions of the plans faithfully, administrative interference and the restriction of regulations. The solution of these problems begins with improving management.

To establish efficiency in pollution treatment, rigorous management is required to promote it and insure its progress. Clear evidence of this argument is the fact that after pollution fines were imposed in some areas, many enterprises have become active in pollution treatment and no longer dump the "three wastes" without any concern for the consequences as they did in the past. In some areas the building license for capital construction is issued only after the project has obtained approval from the local environmental protection department; this practice has also shown good results. In any case, the scientific management must be strengthened during the readjustment period in order to protect our environment effectively.

It is our belief that the environment of our country can be improved gradually during the national economic readjustment with sufficient attention and progressive action.

ENVIRONMENTAL SCIENCE AREAS OF STUDY DISCUSSED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 6, 1980 pp 2-4

[Article by Ke Huan [2688 3883]]

[Text] In spite of its short history, environmental science has been expanding quite rapidly. In projecting its long-term development, one often wonders about the objectives of this ever-changing and complex science of the environment and the way to accomplish them. We believe it must consider first of all the current environmental pollution in our country and the problems of environmental protection which are likely to crop up during the progress of the four modernizations. Second, it must consider the state of our scientific research forces and the scientific characteristics of the environmental science per se. In a word, it must be realistic.

Environmental pollution in our country has been rather serious and it is getting worse. New forms of industrial and agricultural pollution are bound to emerge along with the progress of the four modernizations in the next 20 years. The study of environmental science should cope with this reality and strive to contribute to the prevention and treatment of environmental pollution.

As far as our research forces are concerned, they have had some 10 years' working experience with scientific and engineering specialists engaged in practically all areas of research in environmental science. But the forces are widely scattered and their approaches are somewhat backward. They depend on joint efforts to cope with many problems they encounter in environmental science.

Judged by its scientific implications, environmental science, born of the threat of environmental pollution, has been instrumental in promoting environmental protection. It is therefore a practical science. Although environmental science covers research in widely different areas, such as the atmosphere, water streams, soil, living things, etc., all the environmental factors are closely related and form an all-embracing totality. It is therefore an integrated as well as a comprehensive science, as it depends on the cooperation of other branches of science in its comprehensive studies. As environmental problems are closely related to energy resources, natural resources, agriculture, population, urbanization, etc., environmental science should work out a scientific system to analyze all these factors.

A comprehensive survey of all these factors tells us that we must handle with care the immediate and long-term objectives, the relationship between practical and scientific tasks and between crucial and general problems. We believe we should take care of the long-term objectives as we tackle the immediate problems, strive to develop science while working to accomplish the task of protecting our environment, and tackle both crucial and general problems. Inasmuch as energy, natural resources, agriculture and urbanization are the problems which affect environmental quality as a whole, we recommend that we use the existing research base to target our research to such areas as energy and environment, natural resources and environment, agricultural modernization and environment, and urbanization and environment.

1. The Study of Energy Resources and Environment

The amount, structure and methods of energy consumption are directly related to environmental pollution. About 80 percent of the air pollutants originate from the consumption of energy. The annual energy consumption of our country is about 600 million tons of standard coal, of which 70 percent is coal. When we burn one ton of poor quality coal, it generates 60 kg of sulfur dioxide, 10 kg of dust and 6 kg of nitrogen oxide. By the year 2000 if the per capita annual average were U.S. \$1,000, the energy consumption of our country as a whole would amount to 1.8-2 billion tons, more than three times the current level. But the discharge of pollutants, measured by the existing level, would be far more than tripled. Due to poor management and outmoded technology and equipment, the energy utilization rate in our country is only about 28 percent, a little over one-half the 40-50 percent rate attained in the industrialized countries. This accounts for part of our environmental pollution. If we could raise the energy utilization rate to 40 percent, we would save about 200 million tons of standard coal, one-third of the energy consumed at present. The coefficient of our nation's energy consumption increase (the ratio between energy consumption increase and gross output value) is 1.24, or 23-170 percent higher than that of the industrialized countries. For instance, our energy consumed for smelting or producing synthetic ammonia is twice that of Japan. This is also one of the causes of the three wastes.

The most basic measure to control pollution due to energy consumption is to conserve energy and cut back energy consumption. Apart from better management, renewal of equipment and improvement of technology, we must look for energy-conserving technology, such as the study to blend gas with water in order to save gasoline. Once our energy conservation work reaches the advanced international level, it is estimated we could reduce the air pollutants by 30-40 percent. Although many suitable technical devices, such as urban gasification, central heating, liquefaction of petroleum gas, coal cleaning, semi-coking, and improvement of honeycomb briquets, are mostly standardized, there are still some problems to resolve in order to make them fit for our use. Furthermore, no matter what advanced technology we use, it is difficult to achieve zero discharge of pollutants. The pollutants which manage to escape will have to be diluted, diffused and degraded in the environment. The law of the movement and changes of pollutants in the environment is the basic criterion to determine environmental tolerance, evaluate environmental quality and establish environmental standard. At present we should study the law of atmospheric pollution due to burning coal in the light of the composition of our energy

resources. This includes, among other matters, the process and mechanism of converting sulfur dioxide into air soluble sulfate colloid, the law of environmental conversion of multiring aromatic hydrocarbon, the formation and danger of acid rain and the conveyance of burning coal pollutants by atmospheric diffusion.

2. The Study of Natural Resources and Environment

By natural resources we mean minerals, land, forests, rivers, streams, lakes, oceans, etc. Some of these regenerate, some recur, while others do not regenerate. People love to say that nature provides us with inexhaustible natural resources. In reality, if we do not value and protect these seemingly inexhaustible resources and waste them irresponsibly, we will run into serious shortages even if they do regenerate or recur, let alone those which do not regenerate. Take water for example. Although it recurs, the volume is limited. The annual surface water runoff in our country is 2.6 trillion cubic meters, or 5.5 percent of the total runoff of the world. The per capita runoff is only 2,700 cubic meters, 1/4 of the world average, much lower than the level of many countries. According to estimates, our ground water reserve is about 700 billion cubic meters, only 140-200 billion cubic meters of which is fit for human use. There are about 1 trillion cubic meters of surface water. The total of these two is about 1.1 trillion cubic meters after adjusting for duplication. By the year 2000, water required for agriculture, industry and human consumption will be double the current amount and will reach 600-700 billion cubic meters. Theoretically, there will be enough water. But both surface and ground water, due to seasonal changes and regional differences, are not evenly distributed during all seasons and in all localities. Many localities often face acute water shortage. Moreover, as water pollution worsens, the quality of water will deteriorate. If the decline in the quality and quantity of water were not arrested, the four modernizations would suffer.

There are many causes of water pollution, but the principal ones are waste of water and irresponsible discharge of waste water.

Instances of wasting water are found in many areas. Take agricultural use of water, for example. As a rule, one mu of land needs about 500 cubic meters of water. In some areas, however, people use more than 1,000 cubic meters of water per mu of land. This is waste of water and a cause of soil salinization. Our industry, due to failure to recycle and conserve water, uses much more water than the industrialized countries, which recycle 50-80 percent of their used water. Our water recycling rate is only 20-30 percent. Take smelting, for example. We use about 30 tons of water per ton of steel smelted, whereas 3-5 tons are enough for the same job in other countries. Excessive extraction of ground water in some localities has led to lowering the ground water level and even surface subsidence.

Excessive use of water means excessive waste of water. One ton of waste water pollutes as much as 14 times the volume of natural water. The daily discharge of waste water in our country is 78.6 million tons, most of which is discharged untreated into the natural streams. Take Beijing, for example. There are 46 rivers and canals in the city or 900 kilometers of water networks, 400 kilometers of which are polluted. Most of these, including 34 streams known as the "new dragon tentacles," are in the city. There are over 400 wells, and 100 of them

contain more than the standard amount of phenol, cyanogen, arsenic, mercury and chromium. Due to increasing hardness of the water, a number of light industrial plants have to spend several million yuan annually to soften the water and treat accumulated deposits in their furnaces.

The very first step to control water pollution is to economize the use of water and apply a water recycling technique to cut down water consumption. The next thing is to treat waste water and third to take positive steps to treat water streams already polluted so as to restore their purity. The technology of the first two measures, though more or less standardized, should be comprehensively evaluated in the light of the actual conditions of our country. We must also strive to develop new technology, new materials, new principles and new methods. The treatment of polluted streams should include investigations of the origin, distribution and the law of the growth and decline of toxic matters in the streams (especially heavy metals and organic toxic substances not easily degraded). Then we have to look for comprehensive methods of treatment, including engineering and natural purification such as chemical solidification of metals, purification of oxidation ponds for algae colonies and purification of aquatic plants.

3. The Study of Agricultural Modernization and Environment

Food is an important world problem today. The principal source of food is agriculture. Right after the liberation, the acreage of arable land per capita in our country was 2.7 mu. Now the acreage is down to 1.5 mu per capita, about one-third the average of many other countries. This is due to population growth and the use of 500 million mu of agricultural land for capital construction and other projects, even though we have reclaimed 400 million mu of wasteland in the last 30 years. To modernize agriculture, it is essential to increase the per unit productivity. The agricultural development in foreign countries tells us that extensive application of pesticides and chemical fertilizers is required to increase agricultural production. Today the whole world produces 2 million tons of farm chemicals--500 different kinds, of which 100 are popularly used. Most of these farm chemicals end up in the environment. There are several hundred pesticide factories in our country. They produce more than 80 kinds of farm chemicals, totalling 500,000 tons per year. But only 160,000 tons of the total are effective. We are the world's fourth largest pesticide producer. The composition of the pesticides we produce contain nearly 50 percent organic chlorine. Many varieties which do not degrade easily in the environment remain active for a long time and pose many environmental hazards. As for chemical fertilizers, the crops absorb only 30-70 percent of those applied. The remainder escape into the environment where they are converted into various harmful substances. Moreover, extensive use of waste water for irrigation is bound to produce many environmental problems. These facts show how seriously our agricultural environment is polluted.

In view of the increasing use of pesticides and chemical fertilizers and the extensive application of waste water for irrigation, we must intensify our studies of environmental pollution by agriculture, including such items as the retention, distribution and degradation of organic chlorine pesticides in the environment and their accumulation and supersession in living organisms; and the nutritional value of nitrogen and phosphorus as they are converted in the environment, in order to

provide a scientific basis for rational utilization of pesticides and chemical fertilizers and a healthy approach to the use of waste water for irrigation.

4. The Study of Urbanization and Environment

Urbanization is an important part of the world population problem. While cities occupy 0.3 percent of the world's dry land, city populations, however, constitute 38.6 percent of the world's population. Our city population, which has doubled since liberation, is about 16.2 percent of our total population. We have 199 cities, 13 of which are cities of 1 million or more people each, 27 with 0.5-1 million each, 59 with 0.25-0.5 million each, while the remaining 100 have less than 200,000 each. The foremost problem arising from urbanization is high density of population. Take Beijing, for example. The population of our national capital has increased 2.5 times in the last 30 years. There are 304 people per hectare within the city limits, twice as dense as the population of Tokyo. High population density means less open space for relaxation and physical activities. According to estimates, a healthy urban environment should provide each resident with 30 square meters of greenery. Today, each resident in Beijing has only 5 square meters of greenery. Dense population puts pressure on material supplies and the disposal of waste. According to American statistics, a city of 1 million people which requires a daily supply of 625 million tons of water, 2,000 tons of foodstuff and 9,500 tons of fuel, discharges 5 billion tons of waste water, 2,000 tons of solid waste and 950 tons of air pollutants. There are also problems of overcrowded housing, traffic jams, noise and serious pollution. An irrational city layout would make the situation even worse. The fact that the incidence of disease is higher in cities than in villages is undeniably due to city environment as a whole.

To improve city environment, it is necessary to study the city ecology and its overall scale. It is also necessary to study the impact of city environmental pollution on human health and its effect on the ecology, climate and engineering, and the way to improve city environment by extending the greenery, woods and water surface. It is wise to group a city and its surrounding areas to form an entity for comprehensive research. For instance, an environmental study of Beijing, Tianjin and the Bohai Bay area might provide a scientific basis for regional planning and pollution control.

5. Other Areas of Study

All the problems which are likely to arise now or in the distant future should be included in our scientific research. We must begin now to study the basic law of environmental pollution and renewal; the foundation work of environmental protection, such as unified analysis of environmental pollution, materials and samples of environmental standard, nationwide surveys of environmental background and the extent of pollution, an environmental standard and the storage of samples and data, because they take time to build up. We should not expect to get instant results. Moreover, as we proceed with actual environmental protection, we should also direct our attention to the accumulation of scientific knowledge by means of systems analysis and models so as to work out the technology and policy of environmental protection and organize our production in conformity with both ecological and economic laws.

5360

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ATMOSPHERIC POLLUTION IN BEIJING ANALYZED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 6, 1980 pp 5-6

[Article by Tai Qisheng [6733 0796 3932]

[Text] The seasonal differences in atmospheric pollution in Beijing are clearly noticeable; it is most severe in winter and least severe in summer. In winter-time, when people burn twice as much coal for heating, the sulfur dioxide and carbon monoxide in the air are triple and quadruple respectively what they are in summer. In the four sections of the city there are about 1 million household stoves discharging smoke and dust day and night, and the city appears to be enveloped in smog. On the basis of continued monitoring since 1971, over 80 percent of the samples collected in winter contain more sulfur dioxide than the state standard. The area where the daytime density is over state standard covers both the city and part of the suburbs, and the polluted area stretches over 1,000 square kilometers. The area and extent of pollution are much smaller in summer because people do not burn so much coal and the air is purified by rainfall, trees and lawns. Only 10 percent of the samples collected in summer contain sulfur dioxide. The worst polluted localities are residential areas without either gas or liquefied petroleum gas but permeated with streetside factories and bustling business centers.

The extent of pollution in Beijing varies from one area to another. Atmospheric pollution is conspicuous in commercial areas and residential areas permeated with medium and small factories. The worst polluted localities are Wangfujing, Xidan, the Qianmen business district and Hufangqiao of Xuanwuqu, where 98 percent of the samples collected show more dust in the atmosphere than the prescribed level, and the amount is double in the winter. The daytime average density of sulfur dioxide is double that in those residential areas with central heating and triple that in the sanitary areas. Pollution in wintertime at Xuanwuqu and Chongwenqu, where there are streetside factories, is as bad as that at Beixinan and Jindingjie in Shijingshanqu. The people of these localities live in smog almost the year round.

As the number of automobiles increases rapidly in Beijing, pollution by automobile exhaust gas is getting more serious every day because the automobiles do not have purification equipment. The average daytime density of carbon monoxide at the busy traffic intersections is six times the standard level, four times that in those residential areas with central heating and six times that in the sanitary areas. The air at the busy traffic centers contains more lead, hydrocarbons, nitro-oxides and dust than in all other areas.

Temperature inversion in Beijing occurs about 85 percent of the time in the fall and winter, but only 50-70 percent of the time during the other seasons. It begins at dusk and dissipates at about 1000 the following morning. Temperature inversion occurs often during the peak coal burning season and causes extensive and severe atmospheric pollution because it obstructs the diffusion of atmospheric pollutants. The density of sulfur dioxide and dust during temperature inversion is two-three times that where there is no temperature inversion. Prolonged temperature inversion and fog bring on something similar to the London fog. According to monitoring data, the amount of dust in the air as shown by samples collected in the different areas of Beijing is 95 percent over the standard level, while the daytime dust density is two times the standard level. In busy commercial areas, noncentral heated areas and areas permeated with medium and small factories, the density of dust in the air is two-four times the standard level, while the sample average is 98 percent over the standard. The monthly average amount of fallen dust is about 50 tons per square kilometer, and the average may go as high as 80 tons in severe dust-storms. The amount drops to 25 tons in summer when the air is clean. In areas without central heating and busy commercial centers, the fallen dust is double that in the sanitary and clean localities.

According to data analysis, the number of foggy and dusty days has increased noticeably in the past 10 years. The number of foggy days which obstruct pollutant diffusion occurred 150 more times in 1971-1978 than in 1961-1970, an increase of more than 30 percent. There were 1,000 more dusty days, a 50-percent increase, during the same period. The increase in the number of both foggy and dusty days contributes heavily to the worsening air pollution from year to year. The increase in chemicals, dust and air-soluble colloids in the air makes the atmosphere dirty and causes meteorological changes. The longest spell of fog, lasting 50 hours, in the history of Beijing took place in December 1968. If such long spells of fog were to recur, it would be a health hazard to the people of the nation's capital.

Atmospheric pollution in Beijing has already become a health hazard. Studies of pollution-related diseases and deaths indicate that the incidence of nasal cavity diseases, simple rhinitis, pharyngitis and epistaxis are higher in industrial and highly polluted areas than in nonindustrial and sanitary areas. The mortality of pollution-related lung cancer patients in the city is double that in the suburbs. The mortality of lung cancer patients in areas of serious air pollution is four times higher than in the outer suburbs. The most disturbing phenomenon in Beijing is the increasing number of deaths due to lung cancer, which has increased about 30 percent in the 5 years 1974-1978. The traffic police in areas highly polluted by automobile exhaust gas have a large content of carbonated hemoglobin in the blood than the local populace. They also show a marked difference in breathing and the amount of organic lead. The principal causes of atmospheric pollution in Beijing are the use of coal as the staple fuel, a limited area of central heating, lack of extensive greenery and water surface, narrow streets, lack of overpasses and a growing number of automobiles. The following are recommendations for improving the atmospheric environment and protecting the health of the people:

1. Adopt effective measures to reduce the discharge of pollutants. First of all, place strict control over those furnaces which have been improved. As soon as

possible issue a standard limiting the discharge of pollutants into the atmosphere. Institute businesslike management and charge fees for waste disposal. Any unit which seriously pollutes the atmosphere and discharges more than the standard pollutants continually must be asked to correct the situation or else pay a fine. Supply low-sulfur coal during the warm season and promote the use of liquefied petroleum gas, especially in residential areas without central heating. In the long term view, an area central heating system should be installed in the city as a whole instead of individual furnaces for individual buildings.

2. The streetside factories in residential areas should be removed or remodeled, as the case may be. Nobody should be allowed to build or expand a factory in a residential area which discharges toxic and harmful substances or generates noise and vibrations. The crucial point now is to cope with those factories which discharge acidic gases containing lead, chromium, mercury, benzene and ethylene chloride and generate noise and vibration.

3. Reduce pollution by automobile exhaust gas. In addition to installing automobile exhaust purification devices, we should construct more overpasses, subways and circumferential railroads in order to keep automobile traffic to a rational level and cut down the number of automobiles travelling in the city. Install more trolleybus lines and control the number of motorcycles.

4. Consider the "aggravating effect of urban heat islands" on atmospheric pollution. Stop suburban building of factories which burn large quantities of fuel and generate intensive heat. The design of high-rise structures should always take into consideration their impact on the city's microclimate. When a factory which pollutes the atmosphere is moved from the city to the suburbs, it should be relocated on the east or west sides of the city where the frequency of easterly and westerly winds is small.

5. Extend the area of greenery, lawns, water surface, small parks and sidewalk greenery. A health protection zone should be installed between residential areas and pollutant-laden factories in the suburbs close to the city. Improve cleaning and sweeping tools. Use moist cleaning machines so as not to stir up the fallen dust.

6. Reinforce periodic and mobile monitoring of atmospheric pollution and initiate studies of atmospheric pollution forecasting.

5360

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MEASURES TO PREVENT DESERTIFICATION PROPOSED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 6, 1980 pp 20, 36

[Article by Ma Wenyuan [7456 2429 0337]

[Text] There are many kinds of environmental pollution. Excessive grazing and firewood collection in arid and semiarid areas which lead to destruction of vegetation, soil erosion and desertification represent one of the most severe forms of damage to the ecological environment. So, transforming deserts and preventing desertification are important measures to protect the environment.

According to UN statistics, desertification today threatens 48 countries and about 600 million people. Desertification, which bears heavily upon the economic development of many countries, has become an omen of worsening environmental deterioration, drawing the attention of a large number of countries.

Our country, which has extensive territory and diverse national conditions, also faces serious environmental problems such as desertification brought about by irrational exploitation of our natural resources. Uncontrolled reclamation and grazing in the past 30 years have increased the area of desertified land by 40 million mu, of which 28.1 percent is due to destruction of vegetation by firewood collection, 24.6 percent by uncontrolled reclamation and 19.8 percent by grazing. An enlarged area of desertification has exposed 209 counties in the "three northern" regions of our country to the threat of windblown sand, which had destroyed 100 million mu each of farms and grassland. Windblown desertified soil can bury houses, obstruct communications and harm the environment. The Wuji railroad is 130 kilometers long, but 80 kilometers are threatened by windblown sand, which forced the train to stop as many as 210 times in 1977. In the Nei Monggol Autonomous Region, 66 out of its 86 banners and counties are victimized by windblown sand, which practically encircles 50 million mu of farms and grassland. The grassland of Wumeng has receded by 27 million mu in 10 years, and the per unit yield of grass has dropped 10-40 percent in the past 20 years. The recession of grassland means a drop in its capacity to support livestock. In the northwestern part of our country, it takes 30 mu of grassland to support one sheep. The grain production in the farming area is an average of about 100 jin per mu, while the least productive area turns out 20 jin or less per mu.

Our natural environment is composed of many factors, such as water, soil, air, heat, light and living things. These natural factors are mutually convertible, mutually

dependent and mutually restrictive. They keep the ecological system stable and balanced. The ecological difficulties caused by man's irrational exploitation of natural resources are often unexpected. The dislocation of one ecological factor leads to changes in another, and the chain reaction can pose very serious problems. When the vegetation in an arid area is destroyed, the exposed land surface deflates. According to the findings of the Baying Commune, Chayouzhongqi, Nei Monggol, an inch of top soil blown away each year means a loss of 30,000 jin of fertile soil, which contains 6 jin of nitrogenous fertilizer, 18 jin of phosphorus fertilizer and 408 jin of organic fertilizer. If this were allowed to continue, the soil would lose more and more fertility. These reactions of the ecological system affect both agriculture and animal husbandry. The windblown sand floating in the air obstructs the radiation of solar heat and the formation of clouds. Reduced rainfall in turn aggravates drought. When the dust floating in the air settles on vegetation, the normal plant photosynthesis is disrupted. Needless to say, they are also threats to human life and health. This is not the only harm done by desertification. According to available data, the Yellow River, which washes away 1.6 billion tons of silt per year, carries along with it nearly 20 million tons of nitrogen, phosphorus and potassium. Desertification in the Yellow River Valley is getting worse every year. The Tengeli, Wulanbuhe and Kubuqi are three deserts adjacent to the Yellow River. The Wulanbuhe Desert alone sends 45,000 cubic meters of sand into the Yellow River each year. This affects not only its water quality but also deposits a tremendous amount of silt at its lower reaches, continually raising the riverbed so much that it is the world's only river above ground level.

Of all the kinds of damage to the ecological environment, desertification is regional in nature. The formation of the Chinese deserts, for example, is due to topography and climate. Two-thirds of our vast territory consists of mountains and plateaus. The major deserts and arid regions are located on the plateaus and basins over 1,000 meters above sea level. The huge region north of a line running from the Daxingan Range in eastern Nei Monggol to the Great Wall and the Kunkun Range is the home of existing and potential deserts. Most of this region is landlocked and inaccessible to the moderating influence of the maritime climate. Massive high plateaus and mountain ranges form a natural barrier which shuts out the moist airstream from the Pacific and Indian Oceans. Dominated by the high pressure system of Siberia and Mongolia, the climate of this region is marked by drought and minimal rainfall. The annual rainfall is less than 400 mm, in some localities only several tens of millimeters. The volume of evaporation is 1400-3000 mm and desiccation is above 4 mm but at Dalimu it goes up as high as 20-60 mm. There is very little vegetation--the coverage is less than 20 percent. Here we find an underground sandy deposit, a source of material for desertification. This fragile ecological system could easily lead to desertification by misguided human efforts.

Once the ecological environment is damaged, it is difficult to restore no matter how hard one works. Consequently, we must not "kill the hen to get the egg" just to satisfy our immediate interests to the detriment of our posterity. We must adopt effective measures to improve the natural environment, stop desertification from spreading and preserve the natural resources for lasting use.

Since the environment embodies the totality of all the natural factors, we should take comparable comprehensive measures to protect it. To promote low-yield primitive farming to expand the tilled acreage in this arid region where the natural factors are unfavorable would very likely endanger the ecological environment. We must have land utilization plans which are compatible with the natural factors of the locality so as to encourage scientific farming and management. All the plans to increase productivity per unit must rule out unbridled reclamation and other activities which destroy the natural vegetation.

This particular region, an important base of animal husbandry, has more than 500 mu of pasture grassland. To protect the existing grassland is to help develop animal husbandry and preserve the ecological balance of this arid region in the northwest. It is especially essential to improve the existing grassland, introduce regional rotation of grazing and create more new grassland. Artificial grassland may be tried wherever possible.

Viewed in terms of long-range considerations, afforestation and grass growing are the basic measures to prevent desertification, protect the environment and promote stable and higher agricultural and animal husbandry production. Our country has more than 1.3 million square kilometers of desert, including the Gobi Desert, which is 1.09 million square kilometers in area, and desertified areas built up in the historic past and at present. Most of the region is fit for forestry and pasturing. Agriculture may be encouraged only in those localities where there are irrigation facilities or the annual rainfall is over 200 mm. As shown by practice, grain production sheltered by a protective forest belt normally shows an increase of about 10 percent. The erection of pasture protection forests protects the grassland and increases the supply of animal feed. To make afforestation compatible with the local conditions, tall trees, shrubs and grass should blend freely. Protective forests of tall trees are good for areas adjacent to urban residential centers, river banks, lakeshores and both sides of roads where the groundwater level is low or irrigation facilities are available. Shrubbery as a rule is good for deserts and wasteland. We must strive especially to cultivate fuel forests to protect natural vegetation and provide a new source of fuel.

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METHODS OF PRODUCING BIOGAS FOR FUEL DESCRIBED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 6, 1980 pp 34-36

[Article by Zhao Dianwu [6392 3013 0063] and Yu Wentao [0151 2429 3447]

[Text] Biogas, a form of bioenergy, derives its energy from solar light and heat. Plants absorb and store solar energy during their growth. Acted upon by microbes, the organic substances of dead plants undergo fermentative decomposition and release a tremendous amount of energy, the biogas. When we burn biogas, the energy is converted into the light and heat we use.

Biogas, a gas containing methane, carbon dioxide and nitrogen, has a high calorific value. It can be used for cooking, illumination, driving internal combustion engines and generating electricity. One cubic meter of biogas, the equivalent of 1.2 kg of coal or 0.7 kg of gasoline, is enough to drive a 3-ton truck for 2.8 kilometers, or it will burn for 6 hours to provide 60-100 watts of light. Better still, when biogas burns, it produces only carbon dioxide and water, which are not air pollutants or harmful to crops or human health. These advantages are not found in mineral fuel.

The raw materials required to produce biogas come from nature in great abundance, including human and animal manure, weeds, stalks, leaves, garbage, etc. Besides, waste industrial and agricultural residues which contain 2 percent or more organic substances, waste residues from food processing, and sludge and mud from waste water treatment plants are also good raw materials. People in some countries grow grass, trees and algae in open spaces and surface water to provide a lasting supply of raw materials.

As a part of their program to develop solar energy, the people of the United States apply methane fermentation to urban and rural wastes to recover fuel gas.

The shape and materials used in building fermentation tanks differ from one country to another. One American biogas generating tank which treats hog excrement and urine consists of a brick underground digestive chamber $1.5 \times 1.5 \times 1.8 \text{ m}^3$ and a water sealed steel gas storage tank $1.8 \times 1.8 \times 0.9 \text{ m}^3$. The digestive chamber and the pigsty are connected by a cement pipe. The biogas storage tank may be built of other materials, such as chloroprene rubber.

India has developed both small and large biogas tanks for villages. A small one may be a single-chamber or double-chamber tank. A large one could be single-chamber, double-chamber or a chain of interlocking digestive chambers. The smallest tank generates 1.4 m³ of biogas per day, while the biggest produces 250 m³ of biogas per day.

Intending to use biogas to replace petroleum, Japan is developing new methods of methane fermentation. It began in 1955 to treat waste liquid from alcohol distillation by means of anaerobic digestion. As of today, more than 10 factories have built their own waste treatment plants. This plan for factories to treat industrial waste water to generate biogas is unique but not yet popular in other countries.

Utilization of Biogas in Our Villages

We have built over 7 million biogas tanks in the villages, and the most successful ones are in Sichuan. It gives one a wonderful feeling to see people up in the mountains and down on the plains "cooking without burning wood or charcoal, lighting lamps without using oil or electricity." The number of biogas tanks in Sichuan has increased from 410,000 in 1975 to over 4 million. Many of its counties and city suburbs are practically biogasified.

A 10 m³ biogas tank can produce enough gas for a family of five or six people to cook three meals a day and keep their lamps burning. Such a biogas tank, which requires very little labor and material, could be constructed by the masses, and they or the production teams could make their own cooking utensils as well as lamps and lanterns. This would resolve the problem of persistent shortage of firewood in the villages.

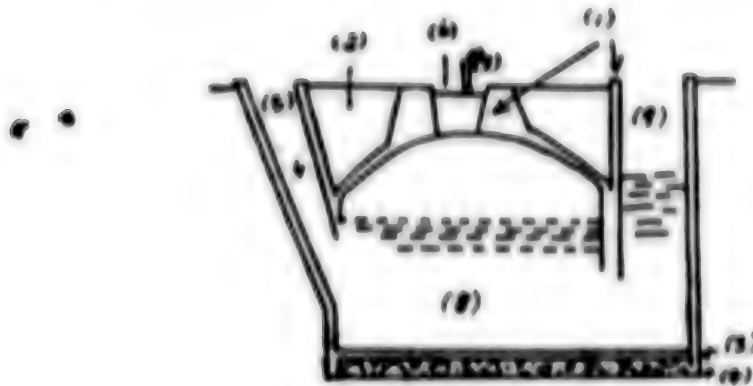
The villagers of our country have built different kinds of biogas tanks--round, oval or square. Some have hydraulic chambers; others don't. Some have separate entry and exit for feed stock; others don't. Some are completely underground; others only half underground. The structure may be made of reinforced concrete; blended lime, mud and sand; or it may be a mortar structure with a brick arched roof.

The following are a few frequently seen biogas tanks:

1. Round Earthen Biogas Tank

This kind of biogas tank is built of lime powder and clay by "dry ramming" (piling up bricks). The ratio of lime powder to clay is 1:4 for tank wells and 1:3 for the arched roof. When the proper proportions of the twin-blend materials are ascertained, they are mixed dry, then water is added and the mixture is blended until the compound becomes doughy. This type of structure is popular in Fugouxian, Henan. See Figure 1.

Figure 1. Round Earthen Biogas Tank of Lime and Clay



- (1) Tank wall of blend of lime and clay
- (2) Refilled earth
- (3) Tri-blend earth
- (4) Crushed stone
- (5) Feed stock entry
- (6) Fermentation chamber opening
- (7) Gas vent
- (8) Fermentation chamber
- (9) Feed stock exit

This twin-blend earthen biogas tank is inexpensive in cost and material and yet firm. According to a survey, once the tank is built, its compressive strength reaches 1.47 kg/m^2 in 4 days, 2.95 kg/m^2 in 30 days, 12.36 kg/m^2 in 1 year, 19.1 kg/m^2 in 8 years. The compression data show that the firmness of this twin-blend biogas tank increases as time goes on.

2. Three-in-One Biogas Tank

The tank is oval in shape. See Figure 2. It is built of twin-blend earthen material at the ratio of 1:9 (lime powder to clay). The arched roof is of moderate span. It is called "three-in-one" because a pigsty and a lavatory are built on top of the tank to form a totality of three. See Figure 3.

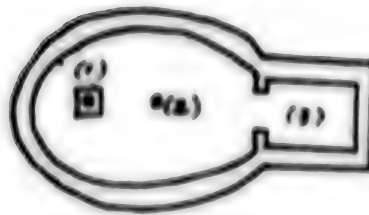
This type of tank is now quite popular in the suburbs of Baoding, Hebei.

3. Hydraulic Pressure Biogas Tank

The hydraulic pressure biogas tank is very popular in Mianyang, Sichuan, because it has several good points:

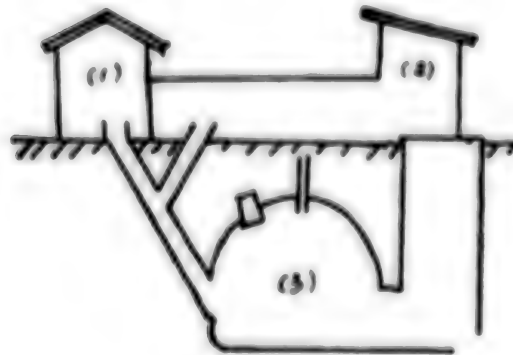
- (1) The feed stock input and output are separated from the gas compartment, which is tightly sealed with a permanent lid. The feed stock compartments are water sealed. With the gas compartment and the fermentation chamber tightly sealed, feed stock may be put in and taken out at any time.

Figure 2. Plane Sketch



- (1) Feed stock entry
- (2) Hydraulic tank
- (3) Gas vent

Figure 3. Vertical Section of Three-in-One Biogas Tank



- (1) Lavatory
- (2) Pigsty
- (3) Biogas tank

(2) Since the water level in the feed stock input and output compartments rises and falls automatically, the biogas pressure in the gas compartment is therefore properly adjusted. Consequently, when biogas is used for cooking and illumination, it burns well and steadily.

(3) When the tank produces too much gas, the tank fluid and pressure will increase. The fluid in the tank, due to storage provided by the hydraulic pressure compartment, will not overflow and contaminate the environment.

The structure of the hydraulic pressure biogas tank is quite simple. It consists of a feed stock input compartment, a fermentation chamber, a gas compartment, a feed

stock output compartment, and a hydraulic pressure housing and a biogas vent. Its building materials are stone, tri-blend earth and pebbles.

The biogas tanks in our villages are built in various shapes and styles to meet the unique conditions of different localities. The "three-in-one" structure which joins a lavatory and a pigsty to a tightly sealed tank makes it easier to feed in human and animal manure and other organic wastes. This improves the rural environment, reduces contagious diseases and prevents pollution of water sources. When stalks, weeds, inedible vegetables and other organic matter are fermented in the tank, the residual wastes and digestive fluids are still good fertilizers, in fact more fertile than before the fermentation. Some localities are concerned that the promotion of biogas might draw away nutrients from the farmland. Actual practice attests that such concern and worry are unwarranted.

At present our villages use biogas just to meet their daily needs. Later, when the technology improves, we could build larger tanks to produce more biogas to run various farm machines, such as diesel engines, water pumps, weeding machines and farm sprayers.

Anaerobic Treatment of Industrial Wastes

Many of our cities and factories have been using anaerobic digestion for treating city sewage and industrial wastes to recover biogas and industrial raw materials. The anaerobic digestion is also used to treat residual sludge to produce biogas and degrade toxic substances so as to turn useless sludge into serviceable fertilizer. This is a comprehensive process to treat urban and industrial wastes, and we have acquired a lot of experience in this particular field.

The anaerobic treatment of urban nightsoil produces biogas and destroys pathogenic bacteria in parasite eggs in human and animal manure. This is a great improvement in urban control of nightsoil and the pollution of water sources. In South China successful biogas projects have become most effective in the control of schistosomiasis and contagious diseases. Biogas derived from anaerobic treatment of nightsoil is now used in Foshan, Guangdong, to generate electricity.

Some factories use environment-polluting wastes to produce biogas and industrial raw material and to turn the residual sludge into good fertilizer. This is a comprehensive process to treat stubborn wastes. The Nanyang Alcohol Distillery, Henan, used to have 11-18 tons of distiller's grain left after distilling 1 ton of alcohol. In the past, it gave part of the grain to peasants as fuel and dumped the rest into the river. Since it built two digestive tanks, each of 2,000m³ capacity, it has purified the biogas produced to eliminate carbon dioxide and uses the extracted methane to produce some 700 tons of dichloromethane and 230 tons of trichloromethane a year. These are excellent fertilizers. Other factories are using anaerobic digestion to treat their industrial sewage which contains organic matter and sludge left behind after treatment. Tests show that the organic matter becomes degraded during the production of biogas by means of fermentation. This process, simple and energy-efficient, is capable of turning stubborn sludge into useful matter.

Since industrial sewage and wastes vary in composition, we need more tests to determine which are amenable to anaerobic digestion, the processes involved, the degree of the degradation of organic matter and the yield of biogas. Bioenergy, the use of biogas, has a very promising future. It could provide the villages with fuel and fertilizer as well as power. Consequently, extensive utilization of biogas could have a great bearing on our national economy.

5360

CSO: 5000/4048

DESULFURIZATION, DECYANATION TECHNIQUE DEVELOPED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 6, 1980 pp 39-40, 25

[Article by Xu Changsong [1776 7022 2646]

[Text] Coal decomposed under high temperature during coking produces a series of complex chemical reactions which yield coke, coal tar and coke oven gas. The composition of coke oven gas is complicated. A large part of it consists of valuable industrial chemicals which, however, can also be toxic environmental pollutants. They must be recovered for purification. Our existing technique is good enough to recover such products as coarse benzene and ammonium sulfide. The benzene, after final cooling wash, is desulfurized by arsenic alkali or the A, D, A method. As a rule, the coke oven gas produced by smelting plants is not desulfurized. So, toxic substances such as hydrogen sulfide and hydrogen cyanide can still pollute the atmosphere and streams and corrode production equipment.

The amount of hydrogen sulfide in the coke oven gas depends on the sulfur content of the coal used for coking. Normally about 40 percent, or 6-30 g/m³ [standard temperature and pressure], converts into coal gas, but hydrogen sulfide from coking does not pose a direct pollution threat to the atmosphere. However, when coke oven gas is burned as household or industrial fuel, the hydrogen sulfide in the gas becomes the notorious sulfur dioxide:



The hydrogen sulfide which escapes into the atmosphere will oxidize gradually to form sulfur dioxide according to the above formula.

According to our survey, the density of sulfur dioxide in kitchens of those residential areas where undesulfurized coke oven gas is used amounts to 10 or many more times the established environmental level. It is therefore better to desulfurize the gas during the production process than to try to treat the sulfur dioxide after it is already formed.

There is less hydrogen cyanide, about 0.5-1.5 g/m³, in the gas than sulfur dioxide, but it is much higher in toxicity. At the early stage of coking when the temperature is comparatively low, no hydrogen cyanide is formed even though coke oven gas

is generated. As coking reaches the halfway point, when the temperature in the top space of the oven gets to more than 800 degrees Celsius, the reaction between the red hot coal and the ammonia in the gas forms hydrogen cyanide:



During the recovery of coarse benzene in the coking process, 60-70 percent of the hydrogen cyanide escapes through the opening at the top of the cold water framework into the atmosphere, while 30-40 percent of it mixes with the phenol-laden waste water. According to our survey, the density of hydrogen cyanide at the top of the cold water framework is over 200 mg/m³ and even higher density is detected in areas near the factory. The hydrogen cyanide in the air will eventually be washed down by rain into bodies of water as one of the "five toxins" which pollute the water. That is why the coking industry is known as "the principal culprit" of water pollution. So the gas should be desulfurized and decyanated before the final cooling.

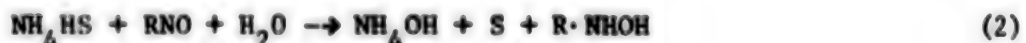
We organized a cooperative scientific research unit composed of representatives of the Capital Steel Corporation, the Anshan Heat Research Institute, the Anshan Coking Institute, the Beijing Municipal Environmental Protection Research Institute and the General Chemical Plant of the Anshan Steel Complex to tackle the problem. After several years of research, it came up with a new technique to remove sulfur dioxide and hydrogen cyanide from coke oven gas. It was rated a breakthrough in the desulfurization and decyanation of the coke oven gas by a meeting called by the Ministry of Metallurgy to evaluate the technique. Those attending the meeting were so impressed by the effectiveness of the technique in eliminating sulfur dioxide and especially hydrogen cyanide, which pollutes the atmosphere and streams, that they believe it compares favorably in terms of technology and economy with similar advanced techniques used in many foreign countries.

The removal is achieved in the following formulations by using ammonia in the coke oven gas as an alkali absorbent, the picric acid as a catalyst and the aqueous solution as a rinsing absorbent:

1. The absorption of H₂S



2. The oxidation of H₂S



3. The regeneration of picric acid



The picric acid is the popular name of 2,4,6 trinitrophenol, a yellowish crystal which is a powerful explosive. It must be kept in water to prevent explosion but is safe to use. Since it regenerates completely, very little of it is lost when used. The ammonium polysulfide required for decyanation is produced within the process.

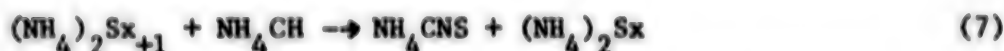
4. The production of ammonium polysulfide



5. The absorption of hydrogen cyanide

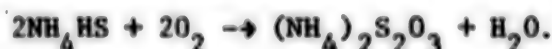


6. The production of thiocyanate



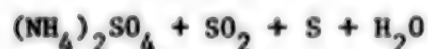
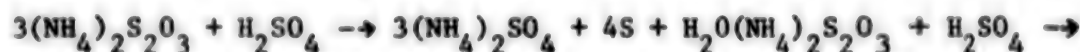
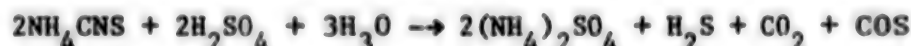
Of these reactions, (6) is extremely fast, (4) and (5) are slower. The fact that the sulfur granules are very fine and distributed evenly over the entire liquid phase helps speed up the dissolution of sulfur, facilitates the formation of polysulfide compounds and increases the speed of reaction and the effectiveness of purification.

The following reaction also occurs during the progress of absorption:

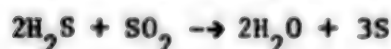
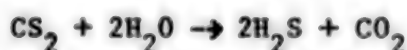


Since the density of the two salts, $(\text{NH}_4)_2\text{S}_2\text{O}_3$ and NH_4CNS , in the absorbent liquid increases continually and affects the effectiveness of absorption, it is necessary to draw out and treat part of the absorbent liquid.

When the low pressure sulfuric acid conversion method is applied to this absorbent liquid, we get the following reactions:



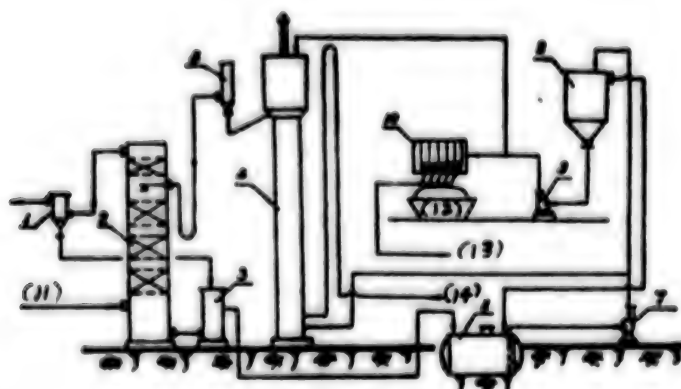
These reactions show that the two salts in the absorbent liquid are decomposed and converted by the sulfuric acid. The N in CNS becomes a part of $(\text{NH}_4)_2\text{SO}_4$ and increases the yield of the latter. The H_2SO_4 , which is spent only for producing $(\text{NH}_4)_2\text{SO}_4$, leaves behind heavy molten sulfur. However, it also yields COS, an organic sulfur which, when reacted by the steam in catalytic conversion, leads to the following formulations:



The remaining H_2S returns to the absorption system for continued absorption.

The entire process consists of two major parts. Figure 1 represents the absorption process. The coke oven gas containing usually 0.2 g/m^3 of coal tar could easily affect the absorption process. So the first thing is to let it pass through the electric detarring precipitator to remove most of the coal tar before it enters the bottom part of the absorption column (2) filled with feed stock. The top part of the column is sprayed with an absorbent liquid containing ammonia and picric acid, a catalyst. The hydrogen sulfide and hydrogen cyanide are removed by gas-liquid counter-current contact. The purified gas passes from the top of the absorption column through the gas-liquid separator (1), where the liquid droplets are removed before it returns to the main gas pipe. The absorbent liquid, which has absorbed hydrogen sulfide and hydrogen cyanide, passes through the liquid sealed tank (3) to the circulation tank (6) before it is sent by the circulation pump (7) to the lower part of the regeneration column (4) where compressed air also enters. The regeneration takes place as they flow upward together. The surplus air escapes to the atmosphere. The absorbent liquid passes from the top of the column through the liquid level regulator (5) to fill the top of the absorbent column for rinsing. The process repeats back and forth to remove sulfur and cyanate. A portion of the absorbent liquid is extracted from the vent of the circulation pump filter pump (9) to take it to the plate pressure filter to extract sulfur. After evaporating condensation, the filtered liquid may be converted into a liquid raw material. A small portion of the liquid at the vent of the pressure filter pump is obtained to eliminate foaming at the top part of the regeneration column.

Figure 1. Desulfurization and Decyanation of Coke Oven Gas



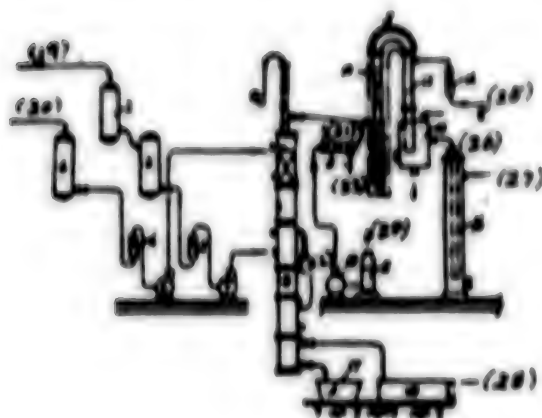
- | | |
|--|----------------------------|
| 1. Gas-Liquid Separator | 2. Absorption Column |
| 3. Liquid Sealed Tank | 4. Regeneration Column |
| 5. Liquid Phase Regulator | 6. Circulating Liquid Tank |
| 7. Circulating Liquid Pump | 8. Intermediate Tank |
| 9. Filter Pump | 10. Plate Pressure Filter |
| (11) Coke Oven Gas | (12) Coarse Sulfur |
| (13) To Circulating Liquid Tank or Waste Treatment | |
| (14) Compressed Air | |

Figure 2 illustrates the conversion process. The liquid raw material, condensed by evaporation, contains 120-140 g/litre of sodium thiocyanate. After filtration, the liquid enters the quantitative chamber (1) and passes through the liquid meter (4) and is then sent by the quantitative pump to the top of the conversion tank (8). The condensed sulfuric acid enters the precipitation tank (2), passing through the quantitative tank (3) and fluid (5), and is then sent by the quantitative pump (7) to the middle of the conversion tank. The sodium thiocyanate and ammonium thiosulfate in the tank react with the sulfuric acid to yield ammonium sulfate and sulfur, which form different layers according to their specific gravity. The converted fluid containing both ammonium sulfate and surplus sulfuric acid is discharged from the lower part of the tank to go through the separator (16), where it is sent to the saturation tank to extract crystalline ammonium sulfate. The surplus sulfuric acid and sulfur are discharged at fixed intervals from the lower part of the conversion tank, where the temperature is higher than the melting point of sulfur. The discharged sulfur, still in molten form, flows into the collector (17). The converted gas is rinsed at the magnetic feed stock layer at the top of the tank with the liquid raw material in the tank to remove the sulfuric acid vapor.

The converted gas containing organic sulfur which regains normal pressure by passing through the adjustment valve combines in a ratio of 1:2 with the steam from the evaporator (9). Heated to 450 degrees Celsius, the organic sulfur is removed through catalytic reaction. The reacted hot gas is chilled and desulfurized in the cooler (13) and the bubbler (15). The cooling liquid, which is an ammonia-laden absorbent liquid from the circulation pump, returns to the absorption system for further use. The chilled gas is led to the gas pipe in front of the absorption column to remove the remaining hydrogen sulfide.

In summary, since this technique depends on the ammonia in the coke oven gas to remove hydrogen sulfide and hydrogen cyanide, there is no need for any additional alkali source. This means a reduction in operating cost, an asset at a time of energy shortage. Moreover, our industry and agriculture need the sulfur and sulfuric acid thus produced. A coking plant capable of producing 50,000 m³/hr of coke oven gas could purify and recover 2,000 tons of sulfur per year, a big saving in foreign exchange. This technique, which eliminates pollution, protects the environment, averts hazards and promotes comprehensive utilization of our natural resources, is indeed an excellent way to rid the coking plants of sulfuric and cyanated pollutants. Its purification ratios are high, 94-96.2 percent for desulfurization, 97-97.8 percent for decyanation, 98 percent for conversion of thiocyanate, and 96-97 percent for catalytic conversion of organic sulfur. It is simple to operate. The resistance of the absorption column is so low that there is hardly any jamming up. The catalysts are cheap and readily available. The equipment and supplies required to run the operation are available in China. All industrial sectors concerned are now designing the scale of industrial production on the basis of the design index and operating procedure of this technique, hoping to begin actual production as soon as possible so as to enhance environmental protection in our country.

Figure 2. Waste Liquid Conversion Process



1. Quantitative Liquid Tank; 2. Condensed Sulfur Acid Precipitator; 3. Condensed Sulfuric Acid Measuring Tank;
- 4, 5, 14. Rotating Flowmeter; 6, 7, 10. Quantitative Pump for Liquid, Sulfuric Acid and Soft Water; 8. Liquid Phase Conversion Tank;
9. Evaporator; 11. Soft Water Measuring Jar;
12. Gas Phase Heating Catalytic Reactor; 13. Cold Rinsing Device;
15. Bubbler; 16. Water-Sealed Tank; 17. Sulfur Collector;
18. Sulfur and Waste Liquid Separator;
- (19) Condensed Sulfuric Acid; (20) Filtered Liquid;
- (21) and (22) Steam; (23) Cooling Water; (24) Soft Water;
- (25) Liquid from Circulating Pump; (26) Gas Vent;
- (27) Liquid Recovery System; (28) Ammonium Sulfate Recovery System.

5360

CSO: 5000/4048

FOREIGN FIRMS MAY JOIN IN REFORESTATION

Manila BULLETIN TODAY in English 29 Mar 81 p 11

[Text] The government will tap foreign capital in the implementation of the country's newly-launched 10-year reforestation program, it was reported.

Through the Ministry of Natural Resources (MNR), the government will encourage joint ventures between foreign firms and local wood companies for the development of industrial tree plantations.

The MNR, it was learned, are now preparing guidelines which will govern the relationship between foreign firms and local companies. [as published]

The guidelines will also specify the extent of equity foreign companies can acquire in joint venture firms. The manner of sharing in the profits from the venture will also be included in the guidelines.

MNR sources said that a package of incentives was being considered as one of the benefits joint venture firms would enjoy if they participate in the intensified reforestation program.

The objective of the program is to reforest 1,000,275 hectares of denuded forest lands in 10 years. Under the program, the private sector will be tasked with reforesting the whole 1,000,275 hectares.

The government, through the bureau of forest development (BFD), will also undertake reforestation in other areas whose total hectareage will be bigger than the goal set for the private sector.

It was reported that some P8.3 million will be allotted by the MNR to finance the initial phases of the reforestation work to be undertaken by the joint venture firms.

The program will involve all timber licensees, leasees of lands for industrial tree plantations and tree farms, communal tree farmers, pasture leases, and other private individuals and organizations.

Its secondary objectives are to establish and develop forest plantations which would supply the raw material needs for dendrothermal power plants and other forest-based industries; improve water supply for domestic needs, and increase water supply for irrigation and hydropower generation.

LOGGING OPERATIONS PROHIBITED IN SINHARAJA FOREST

Kuala Lumpur BUSINESS TIMES in English 23 Feb 81 p 19

[Article by T.B. Peramunetilleke in Colombo]

[Excerpts]

IN AN age when nature's resources are fast being depleted, Sri Lanka can be proud of one of the few remaining tropical rain forests of the world — the Sinharaja or the "King's Forest." It has been saved from being "raped."

During the last two decades the Sinharaja forest was the focal point of controversy in Sri Lanka. Conservationists wanted it preserved while politicians, particularly during the last government, wanted the timber exploited for the plywood factories. However, when the new government came into power in July 1977, wiser heads prevailed and it was decided to conserve this primeval forest.

The Sinharaja covers about 22,000 acres and is situated in the south-western part of Sri Lanka, in the lowland wet zone. The length of the forest from the east to west is about 18 miles and its width is about four to five miles. Two-thirds of the forest is in Sabaragamuwa Province and the remaining third in the Southern province.

It is believed that Sinharaja is millions of years old. Dr (Mrs) Savithri Gunatilleke, professor of botany of the University of Sri Lanka with a Ph.D in Ecology from the University of Aberdeen, United Kingdom, who was the first

ecologist to carry out systematic scientific investigations of the virgin forest, in an article in the *Sri Lanka Forester* says: "The vegetation in Sri Lanka has remained unchanged for a long time. Some of it may be a relic of the flora which existed when the island was a part of the Gondwanaland. Sri Lanka having separated as an island millions of years ago, its wet zone forests have remained quite isolated, without much competition from other tropical rain forest floras, and this may have favoured the evolution of new species, and may explain why 35 per cent of our flora is endemic."

But in 1949, actual tragedy struck Sinharaja when the then government decided to exploit the forest for timber. However, the extensive extraction of timber and the "rape" of Sinharaja started in 1972. Earlier, plywood factories had begun consuming the timber of Sri Lanka's wet zone forests. But the climax of the tragedy came when the largest plywood complex in Asia was established to exploit Sinharaja itself with Canada-Colombo Plan aid. Ten-foot wide roads were opened up in the forest itself and heavy machinery was imported for logging operations and construction of more

roads. A workshop to repair equipment was put up in the forest itself. About 1,500 acres of virgin forest were wantonly felled during this tragic operation, according to the Forest Department.

It was only then that the people of Sri Lanka and also those abroad began to realise the biological importance of the Sinharaja forest. Protests poured in from conservationists and scientists, but the then government went on with the systematic destruction of Sinharaja.

With the exploitation of timber, environmental pollution began at Sinharaja. Before the logging started, the streams in Sinharaja were crystal clear irrespective of weather, but they later became silted and grimy. In the forest there are trees with girths from 8 feet to over 10 feet and heights reaching up to 150 feet. By felling the larger trees, extensive damage was caused to trees of less than four feet in girth. The felling and dragging of the logged trunks with skidders to timber yards destroyed the second generation of plants. The open spaces created by the felling and destruction of the younger trees encouraged the growth of climbers and secondary species.

Today the people of

this country have realised that Sinharaja is a priceless natural resource which cannot be sacrificed for the socio-agricultural requirements of this country. It has also been realised that the forest itself has an effect on the climate, hydrology and soil conservation, apart from the unique flora found there.

Dr Gunatilleke, writing of the flora in the Sinharaja, says: "The flora of the island comprises about 1,365 flowering species, 830 or one-fourth of which are endemic to the island and are not found anywhere else in the world. If the distribution of these endemics is considered, 494 out of the 830 are found only in the rain forests. Our own studies of the tree flora at Sinharaja confirm this. Having sampled all the trees in ten areas, we discovered 163 different species, 60 per cent endemic. These endemics include most of the dominant trees in the forest."

Fortunately, Sinharaja is today in the hands of foresters. Reforestation has been started. It is also being envisaged to simulate an agricultural forest where in addition to the flora that has existed there for millions of years, fruit trees and spices too would be cultivated. — Depthnews Asia

ENVIRONMENTAL PROTECTION, ECOLOGICAL DEGRADATION PROBLEMS REPORTED

Environmental Protection Lag Reported

Warsaw AURA in Polish No 2, Feb 81 p 1

[Text] A group of Polish Academy of Sciences [PAN] professors--Waclaw Brzezinski, Stefan Kozlowski and Zbigniew Wierszicki--published a comprehensive report titled "A Report on the State of the Natural Environment in Poland." We present here, very briefly, a discussion of several chapters.

In evaluating the threat to Poland's natural environment, the authors of the report stated that actions to alleviate the poisoning of and threat to the natural environment that were proposed in the "Guidelines for a Program to Protect the Environment in Poland up to 1990" have not been realized. During the 1975-1979 period, not only were we unable to contain the increasing danger, but the poisoning of the environment increased significantly. Air quality continues to deteriorate. Gas emissions in 1975 amounted to 3 million tons; in 1976, 3.3 million tons; in 1977, 3.4 million tons; and in 1978, 4.4 million tons. In 1978, dust emissions totaled 2.4 million tons, versus 2.2 million tons in 1975.

In Poland's 8,438,000 ha of forest areas, 4.3 percent of the forest regions were damaged. One-half million ha are affected by a plague of pests: lasiocampidae moths and webworms.

Permissible pollution levels are being exceeded in urban-industrial districts. The greatest pollution is occurring in the Upper Silesian region. It is estimated that in the urban zones of Bytom, Ruda Slaska, Gliwice and Aabrze, encompassing an area of 314 km², air pollution causes sicknesses costing 5 billion zlotys annually and damage to forests costing 2.7 billion zlotys annually.

The "Forecast of Changes in the Environment," published in 1978 by the Planning Office for the Development of Warsaw, envisaged that by 1990 the SO₂ concentration will increase fivefold in the Warsaw City Province. Fifty percent of its residents will breathe air that will not meet air purity standards.

Poland's assumed energy development program envisages a sixfold energy increase in the mining and burning of brown coal by the year 2000. This coal has a 1.5 to 2 percent sulfur content. Thus SO₂ emissions will exceed 7 million tons annually in 1990. This must be acknowledged as an ecological catastrophe.

The amount of industrial and municipal sewage discharged into surface waters is increasing. Compared to 1970, the amount of sewage increased 42 percent. During the 1976-1978 period, the amount of sewage discharged into surface waters without being treated at all began to increase. Only 60 percent of the sewage that is treated is done so by mechanical means.

Over the past several years, water pollution has gotten worse instead of improving. This results from the fact that among the 3,600 industrial enterprises having the greatest effect on water-sewage management, 60 percent do not have sewage-treatment plants. Only 336 of 803 cities and towns have sewage-treatment plants, most of which are mechanical.

Large livestock farms, as well as the intensified use of chemicals in agriculture, or rather the incompetent use of mineral fertilizers and plant pesticides, are significant sources of poisons in the natural environment.

The number of streams still carrying clean water is decreasing. The length of river watercourses that remains unpolluted is only 24 percent. The Vistula River no longer contains grade 2 water, only grade 3 and nongrade water remain. Almost one-half of Poland's lakes are seriously polluted. An exceptionally difficult and dangerous situation has arisen in the Warsaw urban centers. The capital city has no sewage-treatment plants and indications are that it will still be so for a long time. Thus, the natural water resources of the Warsaw region are endangered by pollutants and poisons.

We have not managed to slow down the transformation of agricultural land into urban-industrial areas--in 1972 about 15,000 ha were transformed, and in 1977 about 27,000 ha were transformed. However, postindustrial wasteland areas continue to expand steadily; in 1977 it was 102,000 ha (12 percent greater relative to 1975).

The excessive exploitation of the forests is alarming, despite the law on forest management. In many regions of Poland, forest resources for the next 20 years have already been depleted. The ongoing industrialization and urbanization of the country is occurring in a way that is extremely devastating to the natural environment. Thus, the process of "using up nature" is occurring exceptionally fast in Poland.

For the 1971-1990 period, investment outlays amounting to 440 billion zlotys are designated for the program to protect Poland's environment. This sum represents just a bit more than 1 percent of the national income (compared to 3.5 percent in the industrialized countries). With a proper management structure, 4 to 4.5 percent of investment outlays should be designated for protection of the environment. In 1977, outlays in Poland for protecting the air and eliminating wastes amounted to 8.4 billion zlotys, that is 1.4 percent of total investment outlays. What is worse, environmental protection finance plans have not been executed (in 1976, it was 41 percent for air, 67 percent for water, and 57 percent for wastes and reclamation).

As we know, reports on the state of the environment, similar to the one described here, that were published with forethought, continue to be published. We will continue to acquaint our readers with them to the extent of our capabilities.

Scientists Alarmed Over Ecological Degradation

Warsaw SLOWO PONSZECHNE in Polish 20-22 Mar 81 p 9

The "Man and the Environment" Scientific Committee attached to the Polish Academy of Sciences (PAN) Presidium, and Commission V of the Committee on Human and Sociological Problems of Environmental Protection organized in Warsaw an informational-tutorial conference entitled "Continuing Ecological Scandals." Various groups of scientists and journalists participated in this conference, during which they discussed and exchanged views on the dangers to Poland's natural environment.

Prof Dr Włodzimierz Machajlow, chairman of the "Man and the Environment" Committee, briefly characterized the activities of this committee, which collaborates with the Planning Commission of the Council of Ministers. During its 11 years of operation, the committee prepared and compiled 200 scientific experts' reports from all over Poland on various ecological degradations of the environment. Industrial enterprises are the main culprits in this state of affairs.

Above all, Prof Machajlow emphasized the complete insensitivity of the decisionmakers regarding ecological problems.

Among the 200 experts' scientific reports which were compiled in book form and presented to various ministries for urgent intervention, barely 10 percent were acted upon. Our country has been and is being industrialized at the expense of the environment. Thus, the renewal of socioeconomic life must also consider the question of environmental protection on the moral plane as well.

In turn, the committee's scientific secretary, Dr Tomasz Kocan, presented a list of the most compelling experts' reports concerning obvious ecological scandals. These problems and their pollution effects must be mentioned, at least briefly.

The Chelm Cement Combine causes serious pollution of the air, soil and food which, in turn, causes infant mortality and health to worsen significantly.

The Viscose Industry Plants in Tomaszów Mazowiecki are polluting the air and water with carbon disulphide. There are many cases in this region of child debility.

Air pollution in Łódź is causing protracted illnesses, increasing mortality and debasing the physical development of children.

The environmental effects of large livestock farms in the west-central macroregion (around Konin) cause pollution of drinking water, disturb the biology of water, cause the health of the herds to deteriorate and--indirectly--the health of the populace as well.

The scandalous quality of Konin's drinking water. This causes and intensifies virus hepatitis.

An evaluation of the damage of vegetation that will be caused by the projected brown-coal strip mine in the Mosina-Gostyn region. Forecasts indicate that this investment will create a ground depression, diminish the supply of drinking water, decrease agricultural and forest production, and devastate highly productive agricultural areas.

Some aspects of the operating effects of the Lublin Coal Basin on productive agricultural areas are: deformation of surface areas, destruction of irrigation systems, and salination of soil and water.

Protecting health resorts in view of the forecasts on expanding treatments in health resorts in view of the forecasts on expanding treatments in health resorts in the southeastern macroregion. The dangers are: a lack of drinking water, air pollution, and irreversible destruction of sanitary and climatic treatment advantages.

Investigation of the primary aspects of the dangers to the environment associated with the search for, discovery and exploitation of natural gas and crude oil on Polish territory: the dwindling of underground water supplies, water and soil pollution, and the leakage of gas and crude oil have been observed.

The problem of water cleanliness of the Vistula, Narew and Bug rivers in the context of protecting the water intake of the Warsaw metropolitan area: the most dangerous effects are disturbing biological life in water, and increasing carcinogenic formations (DDT, chlorine and pesticides).

This, briefly, is how the greatest ecological scandals appear in Poland. Despite numerous interventions by the "Man and the Environment" Scientific Committee attached to the PAN Presidium with the highest officials and ministries responsible for this state of affairs, only one problem is now being resolved, that is the problem concerning the quality of Konin's drinking water. The other problems remain untouched.

In this situation, Dr Tomasz Kocan said the committee has exhausted its intervention possibilities. We know of no methods nor have we the power to affect the decision-makers. Thus we appeal for help from the mass media.

At the conclusion of the meeting, Prof Dr Zbigniew T. Wierzbicki, chairman of Commission V of the Committee on Human and Sociological Problems on the Protection of the Environment, said, among other things, one cannot speak of a movement for renewal as long as we still do not obtain the understanding of the decisionmakers on questions of ecology. The economic reform in Poland is taking the wrong course because it does not take into account the ecology crisis that is rapidly worsening in Poland.

11899

CSO: 5000

MARINE ENVIRONMENTAL PROTECTION COMMITTEE ESTABLISHED

Baghdad AL-THAWRAH in Arabic 6 Mar 81 p 7

[Article: "Advisory Committee to Monitor and Implement Agreement to Protect the Marine Environment From Pollution"]

[Text] The Ministry of Health has formed an advisory committee associated with the Supreme Environmental Council in Iraq to monitor and implement the Kuwait regional cooperation agreement for protecting the marine environment from pollution and to coordinate with the various quarters concerned.

AL-THAWRAH's correspondent was advised of this by Dr Ibrahim Muhammad Ahmad, director of Human Environmental Affairs, who said that the committee would include members representing the National Institute for Planning and Human Environment and the ministries of Higher Education and Scientific Research, Oil and Industry and Minerals and the General Organization for Ports.

He added that the committee would study fish reserves in the waters of the Arab Gulf, the industrial expansion underway in the area and the effect of air currents on pollution and would evaluate social and economic activities and the needs of the region in order to assist the governments to properly cope with environmental problems.

He stated that the University of Basra had prepared a study on pollution of the waters of the Arab Gulf and the effect of oil tankers on this since the Gulf is the primary area exposed to pollution caused by the large number of oil tankers passing through its waters in addition to ship cleaning operations.

He referred to the need for mutual cooperation and coordination among the countries sharing a common coastline for implementation of this agreement since protection of the marine environment and the coastal areas in the region for future generations was the primary objective of the plan of action that would establish a framework for a sound, comprehensive environmental approach for development of the area in a manner in harmony with the rapid development in this region.

He said that the committee would follow some of the recommendations approved by the Kuwait meeting for the development and protection of the human environment, as well as using the UN environmental programs and foreign expertise and studying the results achieved by the joint experts mission that was organized by the UN environmental program and the Department of Economic Affairs.

CAMPAIGN PLANNED TO FIGHT INSECTS, RODENTS IN AMMAN

Amman AL-DUSTUR in Arabic 16 Mar 81 p 2

[Article: "Extensive Operations Plan Prepared to Fight Insects and Rodents in Capital and Suburbs"]

[Text] Suwaylah, AL-DUSTUR--Dr Muhammad al-Dalahimah, mayor of Suwaylah, stated that the community has agreed with the sanitation department to set up a campaign to fight the rats in the city of Suwaylah.

He added that the department's teams have finished an anti-rat campaign on the outskirts of al-Rashid. During the coming week they will set up a campaign in the city of Suwaylah. He asserted that the campaign will include all residences in Suwaylah.

He stated that the teams will make another round through each residence to confirm that all rats in the area have been killed.

From another standpoint Dr al-Dalahimah explained that during the coming week the community will begin to train a hunting team to exterminate stray dogs in Suwaylah. He stated that this will be coordinated with the sanitation department, inasmuch as the community has contacted the competent authorities in the department for this purpose. It is expected that the stray dog campaign will be concluded during the next 2 weeks.

Dr 'Adnan 'Abd-al-Majid, director of the Household Insect and Rodent Eradication Office under the department, stated that the office has finished preparing an extensive operating plan to combat insects when summer arrives.

He said that the campaign will include the capital and its suburbs. It will also include Suwaylah, Wadi al-Sayr, Na'ur, al-Quwaysimah, Abu 'Alnada, al-Rasifah, Mukhayyam Shanlar and Kharibah al-Suq. He mentioned that the office is currently completing the necessary preparations to carry out the central campaign, which is expected to begin before the end of next month.

Dr 'Abd-al-Majid implored the residents to maintain general cleanliness, especially inside and outside of residences, so that the anticipated campaign can yield the desired results, on one hand, and on the other hand to keep the environment safe from contamination by the hazard of insecticides. He added that the cooperation of the residents in making the campaign successful will help reduce insecticide use.

9605

CSO: 5000

FUNDS ALLOCATED TO FIGHT POLLUTION

Kuwait ARAB TIMES in English 19 Mar 81 p 3

[Text]

KUWAIT, March 18 (AP): Modern oil rigs and factory chimneys sprouting along the Gulf littoral are so aggravating problems of chemical and thermal pollution that one Health Minister has declared the region faces real hazards from land, sea and air.

Kuwaitis have taken their anti-pollution warfare a bit further, mobilising funds for scientific research on ways of combating the tauz dust-storm, a problem older than the oil industry.

The Kuwait Foundation for the Advancement of Sciences has urged neighbouring states on the Gulf shoreline to join the fight.

"The money is there in abundance, but we need collective action to combat pollution," said the foundation's Director General, Adnan Al-Aquil. "If the pollution menace is left unchecked, it would unfold dis-

asters for Kuwait and other countries of the region."

Kuwait has invested millions of dollars in vast fish and shrimp industries and, like its neighbours, relies on the Gulf for most of its drinking water, produced through desalination units.

Saudi Arabia, Qatar, Oman, Bahrain, the United Arab Emirates (UAE), Kuwait, Iraq and Iran had agreed to pool money and efforts in the war against pollution. That campaign is now among the casualties of the Iran-Iraq war.

Tauz

To combat tauz, Kuwait has earmarked an initial 500,000 dollars for research on the origin and nature of the dust-storm, originally believed to blow in from Saudi Arabia and Iraq.

"Preliminary studies have shown that at least 80 per cent of the tauz come from Kuwait itself, and the remaining 20 per cent from Saudi Arabia and Iraq," Al-Aquil said in an interview. "Efforts are continuing

and it is too early for us to say if the problem can be overcome decisively."

Tauz, he said, turns the sky red during the sweltering summer months, sends tiny grains of sand into city structures and "shortens the lifespan of electronic equipment". Losses are enormous, he complained.

One project sponsored by the foundation calls for employing laser-operated radar networks to measure air pollution, said Al-Aquil.

Bahrain has a project for combating seawater pollution caused by oil spills in the Gulf.

A recent spill, originating in Saudi Arabia's eastern offshore oilfields, caused alarm around the Gulf. The slick kept floating perilously near Bahrain, the UAE and Oman until it finally plunged near the Strait of Hormuz, where it was almost two metres thick.

The director of World Information Systems, Richard Golob, was quoted here as warning that oil pollution in the Gulf will increase dramatically over the next decade unless preventive action was taken.

CSO: 5000

SERIOUS FLOODING LIKELY TO CRIPPLE KRDA

Gaborone DAILY NEWS in English 13 Mar 81 p 1

[Text]

SERIOUS flooding in Molepolole is likely to financially cripple the Kweneng Rural Development Association (KRDA).

A press release from the association indicates that the KRDA might have to do major reconstruction costing about P77 000.

According to the release, a number of buildings including the main office block and the library are likely to collapse. It reports that it is immediately necessary to attend the underpinning of foundations and remedial work costing about P12 0000.

"The buildings are already badly cracked as result of flood action on the foundations," the release says.

The release further says that the information, which has been obtained from a survey, has become as a shock to the KRDA. The association has no funds set aside for such work and it is unlikely that the association will find interested donors, the release speculates.

The rain-caused damage report from KRDA coincides with a rainfall report which states that

the total seasonal rainfall from November 1, 1980 to February 28, 1981 was above normal in all districts except in the Chobe and some southwestern parts of the Ghanzi District.

The report, which was issued by the Meteorological Services office in Gaborone, says there is moderate probability that rainfall will exceed 10 millimeters per five-day period, on an average, during the first three weeks of March except in the Kgalegadi and Ghanzi districts. The rainfall is expected to decrease later in all districts.

Meanwhile another press release from KRDA reports that 50 per cent of the 22 new students registered by the Builders' and Carpenters' brigades in Molepolole is made up of women.

According to the release this comes as a result of KRDA's undertaking of a recruitment policy designed to favour women and those from poor "less prosperous families."

The release also states that the same policy will be followed later this year when mechanics students will be admitted to Boikanyo Engineering, which is a subsidiary of KRDA BOPA.

BRIEFS

DROUGHT REPORTED--Zomba, Malawi--Drought and low world commodity prices have hurt Malawi's economy, Finance Minister Lynold Chaziya said in an announcement of tax increases on a wide range of goods. Due to the drought and low prices Malawi's gross domestic product, a measure of its overall output, grew by just under one percent in 1980, he told Parliament on Friday in his annual budget statement. Inflation meanwhile was 18 percent. The Minister said Malawi's foreign exchange earnings were hit by low prices for its tobacco, tea, groundnuts and rice. Mr Chaziya announced an average of 15 percent increases in import duty and excise duty on consumer and luxury goods, including sugar, cigarettes and beer. He said there would also be a 10 percent tax on payments in hotels and restaurants. Meanwhile, in Blantyre, former cabinet minister Gwanda Chakwamba, once one of Malawi's most powerful men, has been sentenced to 22 years in prison after being convicted of sedition and possessing a pistol and forbidden photographs and pamphlets. The judgment on Friday in Malawi's first sedition trial branded the former Minister of Youth and Culture, 45, "a threat, a danger and a menace to the security of the government of Malawi" and "a wolf in sheep's clothing." [Text] [Dar es Salaam DAILY NEWS in English 23 Mar 81 p 1]

FLOODS DESTROY CROPS, HOUSES--Flood waters of Lingadzi River in Lilongwe on Tuesday devastated half of Chimombo Village, leaving 67 houses, property and crops destroyed. Fortunately there were no human casualties as this happened during daytime. However, the flood victims are without food and shelter. Picture shows part of the damage caused by the flood waters. [Text] [Blantyre MALAWI NEWS in English 15 Mar 81 p 1]

CSO: 5000

FLOODS SAID TO COVER 700,000 HECTARES YEARLY

Aduna NEW NIGERIAN in English 31 Mar 81 p 3

[Article from Port Harcourt, SUNDAY URANTA]

[Text]

AT least 700,000 hectares of agricultural land is being submerged annually by flood in the Rivers State, according to the state Governor, Chief Melford Okilo.

This natural disaster in the state, he says, occurs during the high water level season and lasts three to four months during which period the level of rivers in the state rises to 10 metres and overflow their banks.

These facts were made known in Port Harcourt by Chief Okilo at a seminar on flood and erosion control organised by the Niger Delta Basin Development Authority (NDBDA).

He disclosed that most towns and villages along the Rivers Niger and Nun usually lose an average of 20 to 30 feet of land yearly through floods while others were being forced to move to new sites.

Chief Okilo said that because of the annual menace of floods and erosion in some areas of the state, meaningful and significant development in terms of infrastructure, agriculture and industrialisation could not be carried out.

He pointed out that it was in realisation of these problems that the state government had created a directorate for flood, erosion, reclamation and canalisation. He added that 58 million Naira had so far been committed to check the menace in 16 villages in the state.

The governor regretted that since the establishment of the Niger Delta Basin Development Authority, the sponsor, the Federal Government had not shown any physical evidence of the completion of any flood and erosion protection in the Niger Delta.

He enjoined the participants at the seminar to devise ingenious ways for the control of water levels of the Rivers Niger and Benue through dams for irrigation, generation of electricity and the diversion of river courses.

Earlier in his address, Mr. J.A. Eseimokumoh, Chairman of the caretaker committee on the NDBDA, had announced that the authority had retained consultants to study specific areas along the coastal zone and noted that there were remarkable achievements.

BRIEFS

NDOLA POLLUTION 'HEALTH HAZARD'--Zambia has always been proud of its clean air and sunny clear skies, but at Ndola the pollution is now a health hazard. The amount of harmful waste dust that is emitted daily from the cement works coupled with the black soot spewed out from ancient lorries is reaching alarming proportions. In Itawa and Northrise trees and flowers are dying. Vehicles and buildings all over Ndola are coated with an acid corrosive dust that is almost impossible to remove because of its adhesive and abrasive qualities and our wind-screens can become obscured overnight. The damage here is obvious, and who knows what this dangerous nuisance is doing to our lungs? Day in and day out we breathe in these obnoxious fumes and there is talk everywhere of the increase in chest troubles and eye infections. Surely the city fathers could eliminate or at least reduce this awful threat to our health, compel the works to instal proper filters, check on the volume, collaborate with the inspector of factories, or shut the culprits down. Whoever is responsible for letting this pollution cloud our skies should do something at once before many more children die of bronchial infections. [Excerpt] [Lusaka TIMES OF ZAMBIA in English 31 Mar 81 p 7]

CSO: 5000

SCIENTISTS SLAM DDT POLLUTION CLAIMS

Salisbury THE HERALD in English 15 Apr 81 p 2

[Article by Chemist Mafuba]

[Text]

GOVERNMENT research scientists yesterday attacked "hysterical" claims about the level of DDT pollution in Zimbabwe, and said that action by the authorities was continually reducing use of the pesticide.

The on-going exercise, which was started in April, is being conducted by the Chemistry and Soil Research Institute of the Department of Research and Specialist Services in a bid to arrest food contamination in the area of its origin and take appropriate measures in time.

The deputy director of the department, Dr P. M. Grant, and a team of experts yesterday refuted allegations that some of our foodstuffs were contaminated with DDT.

Last week, Mr Ron Thompson, of the Department of National Parks and Wildlife, said:

"We have DDT in our butter, milk, cream, cooking fats—and we have it in our beef."

The research officials, who oversee the use of DDT in the farming sector, were highly critical of the assertion, saying there was no evidence at this stage to support the allegation. The quantity of DDT being used in the farming sector had been reduced by 75 percent during the past seven years.

Measures to ensure that the use of DDT did not get out of hand were being applied through the foreign currency allocation for purchasing the pesticide.

The agricultural sector receives 25 percent of the import while the rest is used for health purposes, which includes spraying malaria-carrying mosquitoes plus tsetse fly. Stringent regulations govern the use and sale of DDT, although the scientists said they were unable to say whether the pesticide was being used accordingly.

The scientists said they were aware of the disadvantages of using DDT, and had recommended measures restricting its use.

The pesticide was being used mainly on cotton and maize, and samples analysed had shown no

traces in grains and very little in cotton seed.

Apart from being harmful to human beings, the scientists said the pesticide encouraged the breeding of Red Spider Mite when used on cotton.

A lot of research would have to be carried out to ensure that substitutes for DDT had no side effects.

"A lot of substitutes that could be used are far more toxic, having an immediate effect on the user," they said. "A lot of hysteria that has been generated over DDT is being based on facts and figures from temperate countries where the pesticide will persist for a long time because the weather is generally cold."

This assumption is supported by a U.N. Food and Agricultural Organization report in 1979 which called for the re-evaluation of the use of DDT in tropical countries as it had been found that its rate of degeneration was more rapid compared to other climatic conditions.

"We are monitoring the situation all the time," said the scientists, adding that more equipment was needed for the job.

MILITIA ASSISTS IN NATURE CONSERVATION

Moscow LITERATURNAYA GAZETA in Russian No 41, 8 Oct 80 p 11

[Article by Professor V. Volchenko, doctor of technical sciences: "The Fate of the Small River"]

[Excerpts] How are our small rivers being protected now, and by whom? By many organizations: by ispolkoms of soviets, basin inspectorates, sanitary and epidemiological stations, fishing observation centers, public conservation advocates.... But in spite of all these "protectors," the rivers are unprotected.

People do not argue with representatives of the militia or the State Automobile Inspection the way that offenders "argue" with fishing and forestry conservation inspectors. And they do not evict them from the premises as some zealous directors have evicted sanitary inspectors. Apparently, the experience of the Ministry of Internal Affairs should be taken into account and continued, and it should be extended to rivers and to nature conservation. Incidentally, this is the practice in several countries.

I am certain that it would be quite logical to give the militia the responsibility for preventive work, conservation control and state inspection services, and that the proper special subdivisions could be organized within the militia.

The question of participation by the Ministry of Internal Affairs in nature conservation is usually responded to with little enthusiasm. And this is a pity! The prestige of the militia and the State Automobile Inspection among citizens could put the work of professional nature conservation on an entirely new level.

8588

CSO: 5000

MILITARY PROCURATOR EXPLAINS CONSERVATION OBJECTIVES

Moscow KRASNAYA ZVEZDA in Russian 5 Feb 81 p 2

[Article by Col Justice A. Polonskiy, Volga MD military procurator: "We Must Protect Our Nature"]

[Text] At the 25th CPSU Congress, the efficient use and all-round protection of natural resources were listed among the most important objectives for the effective development of our national economy. The draft basic guidelines envisaged an entire group of conservation measures.

We are happy to say that much has already been accomplished in the interest of the efficient use and reliable protection of the environment. In our military district, for example, 95.2 percent of the production waste is purified. One-fourth of the water supply at construction enterprises and almost one-third of the water used at aircraft repair enterprises are recycled. Our soldiers treat crops and trees with care during field exercises and maneuvers.

Part of the credit for this careful treatment of nature by our servicemen, workers and employees must be given to the district military council and command and the considerable attention they have given to this matter. Special commissions have been set up in the district to assist in the incorporation of production technology which will reduce environmental pollution and to supervise compliance with conservation regulations in units and at enterprises. Not long ago, the district party and economic aktiv discussed the protection of rivers. A long-range plan for this kind of work was approved and training courses were organized for the personnel of sewage treatment plants.

Political and party organs take a principled approach to each specific violation of the rules governing the use of natural resources. The procurator has been given more extensive authority over the observance of conservation laws.

This makes it all the more important to concentrate on problems that are not fully resolved as yet. Above all, I believe that we must concentrate on instilling people with a sense of personal responsibility for the protection of nature.

Here is a relatively old but indicative example. Not far from a construction site, a military driver dumped some construction debris in a kolkhoz field. He did not do this deliberately: His vehicle broke down. But the debris was not removed.

The driver's action was not judged in a principled manner in the military construction detachment. Soon afterward, other drivers began to unload debris from their vehicles in the same field. This turned a section of the field into a dump. It was not until Lt Col Justice A. Smagin, garrison military procurator, stepped in that the military construction detachment found the people and equipment to remove the debris and recultivate the soil.

As we can see, even one unconscientious individual can inflict considerable damage on nature if he is not stopped in time. It appears that the military builders have now forgotten about the incident in the kolkhoz field. Similar incidents have been encountered in the same construction organization (headed by Lt Col Eng V. Dovbnya). This means that the necessary indoctrination process is not constant here. Apparently, the need to instill citizens with respect for nature must be stipulated in the draft plan of the CPSU Central Committee.

It is particularly important, as experience has shown, to develop a state approach to the protection of the environment in administrators. It is amazing how many "objective" reasons a comrade can cite to justify an unlawful decision. With the knowledge of Lt Col B. Krylov, for instance, 2.5 hectares of land were mistreated and all of the trees were chopped down on half a hectare. Space was needed, you see, for various structures. But after all, laws are passed so that narrow departmental and local interests will not prevail over the interests of the society as a whole.

The military procurator's office had to cool the designing and building zeal of one housing administration chief. Disrupting the architectural lines of the military settlement, he launched the broad-scale construction of garages for privately owned motor vehicles. By a decision of a senior administrator, the garages were moved to another location. This wasted a great deal of labor and material. And all because one administrator overstepped the bounds of his own authority.

Something should also be said about the shortcomings in the technical equipment of some of our enterprises, production units and military and other motor pools. The military procurator of the Kuybyshev Garrison, Lt Justice B. Makhov, once complained to certain administrators about the increase of pollutants in the waste of the vehicle repair enterprise and the reinforced concrete combine. It was assumed that the negligence of certain officials was to blame. But the cause turned out to be more serious. Each year, the production assignments of the enterprise and combine were augmented, but the capacities of their sewage treatment equipment remained the same. After the procuracy stepped in, the situation was corrected, but some damage was nonetheless inflicted on nature. In these cases, the responsibility for violations of the law must obviously be borne not only by enterprise managers but also by those who put them in a difficult position.

Stations for the cleaning and maintenance of various types of equipment are still a "bottleneck." A recent inspection by people's control organs indicated that only 16 percent of them are equipped with recycled water supplies. It would seem that the draft basic guidelines should envisage the increased industrial production of recycling systems of small and medium as well as large capacity.

The protection of nature is a nationwide cause. Each Soviet person must take a proprietary approach to this, a caring and responsible approach.

WATER CONSERVATION DECREE PROMULGATED BY USSR COUNCIL OF MINISTERS

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA SSSR in Russian No 25, 1980 pp 602-604

[Decree No 868 of the USSR Council of Ministers on the Increased Protection of Small Rivers Against Pollution, Contamination and Depletion and on the Efficient Use of Their Water Resources, signed in the Kremlin on 8 October 1980 by Deputy Chairman N. Tikhonov of the USSR Council of Ministers and Administrator of Affairs M. Smirtyukov of the USSR Council of Ministers]

[Text] The USSR Council of Ministers hereby notes that measures conducted by soviet and economic organs, industrial enterprises, kolkhozes and sovkhozes and public organizations in a number of union and autonomous republics, krays and oblasts to preserve the high water level of small rivers and the purity of their water have resulted in the improvement of the water supply and recreational conditions of the urban and rural population and in the reproduction of stocks of fish, water fowl and wildlife.

Some ispolkoms of local soviets of people's deputies and agencies for the regulation of the use and protection of water resources, however, have not taken the necessary steps to reinforce the protection and improve the condition of small rivers and are not monitoring the fulfillment of water conservation measures by enterprises, establishments and organizations, as a result of which the small rivers in a number of the nation's regions are in an unsatisfactory state, and some of them are losing their value.

In order to maintain a good hydrological and hydrochemical balance, improve the sanitary condition and the efficient use of the water resources of small rivers and ensure the comprehensive completion of measures to protect these rivers against pollution, contamination and the depletion of their resources, the USSR Council of Ministers hereby decrees:

1. That union republic councils of ministers, the USSR Ministry of Land Reclamation and Water Management, and the USSR ministries and departments, associations, enterprises, establishments and organizations whose economic activity affects the properties and condition of small rivers (up to 200 kilometers in length) and the purity of their water, will plan and carry out measures to restore the water level of small rivers and the purity of their water, with a view to the completion of these measures in 1981-1985 in the environs of large cities, industrial centers, sites of mass public recreation, regions of scenic wonder and natural preserves.

2. That the union republic councils of ministers will:

Guarantee the compilation and ratification of statutes on the water conservation belts (or zones) of small rivers in 1981, specifying in these statutes the rules governing the economic activity of associations, enterprises, establishments and organizations in the water conservation belts (or zones) of small rivers, as well as the responsibility for maintaining these belts (or zones) in the necessary sanitary condition;

Guarantee, in conjunction with the USSR Ministry of Land Reclamation and Water Management, the compilation of plans for the protection of water in small rivers, in accordance with the procedure established in Decree No 408 of the USSR Council of Ministers of 2 June 1976, and the ratification of these plans, as well as the compilation and approval of the technical and economic specifications for the construction of hydraulic structures and the completion of other general operations which will help to maintain a favorable water balance and the proper sanitary condition of small rivers, and the accompanying design and estimate documents;

Specify, in conjunction with the appropriate ministries and departments of the USSR, the associations, enterprises, establishments and organizations which, in accordance with the ratified plans and approved technical and economic specifications, will be responsible for designing and building the hydraulic structures and completing all other work required to prevent, and eliminate the causes of, the pollution, contamination and depletion of the water resources of small rivers, and draw up schedules for the completion of these water conservation measures.

Envisage, in the plans for USSR ministries and departments and union republic councils of ministers, the completion of these operations by means of capital investments allocated for the development of the corresponding branches of the national economy.

Recommend to kolkhozes and other cooperative and public organizations whose economic activity affects the condition of small rivers, that they allocate funds for water conservation measures to maintain a favorable water level and the proper sanitary condition of small rivers.

3. That USSR Gosplan will envisage, in draft state plans for the economic and social development of the USSR, the allocation of capital investments to union republic councils of ministers for the construction of hydraulic equipment and the completion of other general operations which will help to maintain a good water balance and the proper sanitary condition of small rivers, for the "Water Management" branch.

That the union republic councils of ministers will be authorized to finance this work with the funds allocated to them for operational expenditures.

That the union republic councils of ministers will determine the clients in these operations.

4. That the USSR Ministry of Land Reclamation and Water Management will compile, in conjunction with concerned ministries and departments of the USSR, and ratify

in the established manner, procedural instructions on the determination of the dimensions of water conservation belts (or zones) and the compilation of plans for the protection of small rivers in 1981.

5. That the USSR Ministry of Land Reclamation and Water Management, the State Committee of the USSR for Hydrometeorology and Environmental Control, the USSR Ministry of Geology, the USSR Ministry of the Fish Industry, the USSR Academy of Medical Sciences and other concerned ministries and departments of the USSR will organize comprehensive research in 1981-1985, in accordance with the general program approved by the State Committee of the USSR for Science and Technology, on the efficient use and protection of the water resources of small rivers in the nation's main economic regions.

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CSO: 5000

BRIEFS

MAN-MADE SEA--Karshi (TASS)--Water from the Amu Dar'ya has begun to flow in a heavy stream into the Talimardzhanskoye reservoir. It is conveyed here by hydraulic units installed at the seventh, top station of the Karshinskiy mechanized series. This year the man-made sea will be filled with a billion cubic meters of water, which will be used to irrigate tens of thousands of hectares of cotton on farms in the Karshi steppe. [Text] [Moscow IZVESTIYA in Russian 29 Jan 81 p 1] 8588

EARTHQUAKE IN MOUNTAINS--Khorog, 5 Jan (TASS)--An earthquake shook the Pamir mountains today at 0434 local time. Its epicenter was 40 kilometers south of Khorog--the center of Gorno-Badakhshanskaya Autonomous Oblast. Instruments here recorded a quake of 4 points. In Khorog the force of the quake was 3 points. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Jan 81 p 4] 8588

COASTLINE REINFORCEMENT CENTER--Tbil'si--The more than 200-kilometer-long broken line of the Black Sea coast in our republic, which is suffering from erosion and disintegration, has been under the protection of the Gruzmorberegozashchita Scientific Production Association. This is the nation's first center for the coordination of the activities of various departments and organizations engaged in coastline reinforcement operations. Gruzmorberegozashchita consists of a scientific research sector for the protection of the seashore, six coastal inspection stations and construction and repair organizations at various spots along the Black Sea coast in Georgia. Experts have suggested that costly reinforcement equipment be replaced with a natural method of coastline restoration involving the buildup of beach-forming rock. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Feb 81 p 2] 8588

AFTERSHOCKS FELT--Tashkent, 24 Jan (TASS)--A 4-point earthquake was recorded in Tashkent today at 1846 local time. The intensity of the quake at its epicenter--in the settlement of Nazarbek, located on the city's western boundary--was 5 points. "The relaxation of underground tension is continuing," said V. Ulomov, head of the Tashkent Central Seismic Station. "Around 250 aftershocks have already been recorded since 11 December last year, the date of the Nazarbek earthquake. This has discharged a tremendous amount of energy. Automatic units have been set up to record seismic phenomena and transmit information to the station by radio for the clarification of the nature of processes in this central zone." [Text] [Moscow PRAVDA in Russian 25 Jan 81 p 6] 8588

REBIRTH OF A RIVER--The fish have returned to Kolva River, in the tundra of the Komi ASSR. This is the result of a great deal of conservation work performed here in the last 2 years. In 1980 around 200,000 tons of petroleum and petroleum products were trapped and returned to the production cycle at enterprises of the Komi-Neft' Association and the Ukhta Oil Refinery. [Text] [Moscow PRAVDA in Russian 22 Jan 81 p 6] 8588

SEWAGE TREATMENT--Ural'sk, 25 Oct (TASS)--The Ural'skaspvodnadzor Sanitary Inspectorate recorded the cleanest water in the Ural River in the last 20 years. This was the result of a group of measures to preserve the purity of the Ural-Caspian basin. All cis-Ural industrial enterprises now have purification equipment and recycled water supplies. The consumption of water from this river preserve has been reduced by a third by the widespread construction of waterlines fed by underground sources and irrigation systems using snow melt. Floating stations for the purification of water in river ports, which have successfully undergone testing, are now being manufactured at the Ural'sk Ship Repair and Shipbuilding Plant imeni V. I. Chapayev. [Text] [Moscow PRAVDA in Russian 26 Oct 80 p 2] 8588

EARTHQUAKES IN RESORT--Sochi, 26 Jan (TASS)--The Sochi Seismic Station registered a series of earthquakes in the night of 25/26 January. The strongest--5 points--occurred at 2237 hours and was accompanied by an underground rumble. The epicenter was in the coastal strip of the sea between the resort's Tsentral'nyy and Lazarevskiy rayons. In the morning the station recorded new quakes, but these were moderate. There was no damage in the city or its environs. [Text] [Moscow IZVESTIYA in Russian 27 Jan 81 p 6] 8588

RUN-OFF CONTROL--Nishka--The builders of the Zeidskoye reservoir have begun the construction of the head installation for the regulation of river run-off. The work is being performed by the construction and installation administration of the Karakumgidrostroy Trust. The installation is expected to pump more than 500 cubic meters of water from the Amu Dar'ya into the artificial sea each second. The current will flow through an 18-kilometer feeder, of more than 100 meters in width, that is already being laid. The Zeidskoye reservoir, which is being established close to the mouth of the Karakum Canal, will be the largest in Turkmenistan. In the beginning it will hold more than 3 billion cubic meters of water. This is much more than is now collected in all existing man-made seas. The gigantic reservoir is expected to regulate the run-off from the Amu Dar'ya for years. It will guarantee a constant and larger flow of water through the Karakum Canal in the direction of the Morgaba and Tedzhena valleys, the Prikopetdagskaya Plain and the Turkmen subtropics, and it will also serve as a huge settling tank. When the construction of this fertility-boosting basin is completed, it will be possible to cultivate hundreds of thousands of additional hectares of virgin land near the Kara Kum River and to transform southwest Turkmenistan into a massive center for the production of fine-fiber cotton, vegetables, fruit, grapes and subtropical crops. [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 4 Feb 81 p 4] 8588

EARTHQUAKE NEAR DUSHANBE--Dushanbe, 3 Jan (TASS)--An earthquake was recorded in Tajikistan today at 0857 Moscow time. Its epicenter was 20 kilometers southeast of Dushanbe. The instruments of the seismic station in the epicenter registered an intensity of 4-5 points. The quake registered 2-3 points in the republic capital. [Text] [Moscow PRAVDA in Russian 4 Jan 81 p 6] 8588

FAR EAST VOLCANO--Petropavlovsk-Kamchatskiy, 8 Nov--Shiveluch is awake! This news aroused great interest in the Volcanology Institute of the Far East Scientific Center of the USSR Academy of Sciences. A comprehensive expeditionary team immediately flew to the volcanic eruption zone. Another group of scientists are conducting observations from the Klyuchevskaya Station and are photographing the volcano from an airplane. In 1964 a powerful explosion shook the mountains in the lower reaches of the Kamchatka River. Four gigantic crowns, formed in the crater during the hundred years since the last eruption, were destroyed by this blast. As a result of comprehensive studies conducted by the Volcanology Institute, it was predicted that Shiveluch could be expected to become active again around 1980. This prediction has been confirmed. Since August a crown has been rising out of the viscous and almost red-hot mass in the central crater. "The growth of such crowns," institute Deputy Director B. V. Ivanov said, "usually concludes with so-called directed blast eruptions. This was the case with Shiveluch in 1964 and with Bezymanny Volcano in 1980. The new crown in Shiveluch is now 200 meters high. The observations are being continued." [Text] [Moscow PRAVDA in Russian 9 Nov 80 p 6] 8588

CONFERENCE ON GEOGRAPHY AND AGRICULTURE--Kirovabad, 7 Mar (AZERINFORM)--The comprehensive environmental protection measures conducted at enterprises in Kirovabad were commended at a science-production conference on "Geography and Agriculture" in the city. A report entitled "The Decisions of the 26th CPSU Congress and the 30th Congress of the Communist Party of Azerbaijan and Guidelines for the Efficient Use of the Republic's Natural Resources" was presented by Director G. Aliyev of the Geography Institute, academician of the Azerbaijan SSR Academy of Sciences. Professor Sh. Gasanov informed conference participants of the significance of soil quality studies and the research conducted in this field by the associates of the Geography Institute. The training of environmental protection experts in VUZ's was discussed by Professor F. Gadzhiyev in his report. Other topics connected with environmental protection were also discussed. [Text] [Baku VYSHKA in Russian 8 Mar 81 p 3] 8588

CLEAN AIR CONTROL--The ordinary looking microbus which first appeared on Tallin's streets one day this week has not aroused the attention of pedestrians. But the inscription on its side, "Clean Air Control," is of considerable interest to the curious, and with good reason. The mission being performed by this inconspicuous vehicle is extremely important to all of us. "Last year a special center, uniting various environmental observation and monitoring laboratories, was set up in the republic Administration for Hydrometeorology and Environmental Control," said administration Deputy Chief Ya. Saar. "This bus will serve all of these labs as a mobile lab for expeditionary teams." The vehicle is equipped with highly sensitive instruments which will either immediately detect the contamination of the air by harmful substances (carbon monoxide, sulfur dioxide, hydrogen sulfide and so forth) or make it possible to take test samples of the air, which will then be handled in a stationary laboratory. Naturally, studies of this kind have been conducted in the past, but only in certain stations, located in various neighborhoods where the city's industrial enterprises are concentrated. It has often been impossible to determine the specific party responsible for the harmful emissions that are poisoning the atmosphere, and it is even more difficult in locations where these stations do not exist. Now, with the help of the laboratory on wheels, we will be able to quickly respond at any time to complaints from the public,

regularly monitor certain enterprises and fulfill clean air control assignments.
"Only in Tallin?" "As yet, yes. Now we are testing the equipment and finding the
'hottest' spots affecting the cleanliness of the city's air. On the basis of these
studies, we will later require administrators of specific enterprises to take the
necessary steps, not only in Tallin, but also in other cities in the republic."
[Text] [Tallin SOVETSKAYA ESTONIYA in Russian 18 Jan 81 p 2] 8588

CSO: 5000

SWEDEN OFFICIALLY PROTESTS DANISH POWER PLANT PLAN

Copenhagen **BERLINGSKE TIDENDE** in Danish 13 Feb 81 p 7

[Article by Johannes Bundgård and Peter Kjelstrup]

[Text] At the same time as the Zealand power plants have been contemplating a postponement of the new large coal-fired addition to the Amager Power Plant, the National Swedish Nature Conservancy Board has sent an official complaint regarding the expansion plans to the Danish Environmental Protection Agency. A complaint which has now landed on the table of the energy committee of the Folketing.

According to the complaint, the new plant will cause a substantial increase especially in the sulphur pollution in Sweden where the lime-deficient lakes are particularly exposed. According to the Swedish complaint, the Amager Power Plant alone will cause a rate of pollution of 12 percent of the Swedish limit value for sulphur, and it is also pointed out in the complaint that a similar rate of pollution will hit Denmark during the summer months.

The National Swedish Nature Conservancy Board has, at the same time, made an estimate of the cost of treating the smoke emitted from the new large power plant. Such treatment is estimated to involve an additional cost of 110 million Swedish kronor or an annual operational expenditure, including interest on the investment, of approximately 50 million Swedish kronor.

The complaint from Sweden lies in the energy committee as an enclosure to a reply by Mikael Waldorff (Left-Socialist Party).

The third plant of the Amager Power Plant will provide the Zealand power supply system with an additional effective power of 480 megawatts. The present facilities at the Amager Power Plant are of 230 megawatts, and the expansion will, at the same time, raise the reserve power of all of the power plants in Zealand from 38 to 57 percent, while the Nordic cooperation requires a reserve power of 20 percent only.

According to the most recent prognosis, this lower limit will only be reached in 1989 even if the Amager Power Plant is not expanded, provided the prognosis proves correct. There is, therefore, every likelihood that Elkraft will decide to complete the plant around 1987-88.

The prognosis, which is based on the stagnant power consumption since the middle of 1979, anticipates a future increase of between 2 and 3 percent per annum.

7262
CSO: 5000

ENVIRONMENT AGENCY SEARCHES FOR CHEMICAL DUMP SITES

Copenhagen BERLINSKE TIDENDE in Danish 18 Feb 81 p 3

[Article by Michael Rastrup Smith]

[Text] Are Danish enterprises disposing of their chemical waste by illegal means? The Danish Environmental Protection Agency would like to know. For that reason, a study is at present in progress which will reveal what is happening to the chemical waste in the counties of North Jutland and Århus.

Tom Hansen, M.Eng., of the Technological Institute, is doing the study on behalf of the Environmental Protection Agency. He says:

"Even if the study has not yet been completed, there is much to indicate that considerable quantities of waste oil are being disposed of in ways for which no local exemption has been granted."

The study seeks to establish how much chemical waste is being produced in enterprises in the two counties. It will, subsequently, examine how much waste is reported to the authorities, and how much is delivered to the municipal chemical waste collection points for destruction.

"Ideally, the enterprises should deliver the same amounts of chemical waste to the municipal collection points as they produce. But that is not the case," Tom Hansen says. "Some enterprises have been granted exemption and dispose of their own waste. But even after deducting this amount of waste, we still find a shortage. This shortage is largest in the case of oil waste."

Among the types of inorganic chemical waste not always surrendered for destruction are etching baths and pickling baths from the metal industry. As to the reasons why some enterprises fail to surrender this kind of chemical waste, Tom Hansen says:

"Of course, it is not free to have inorganic waste destroyed. One might, therefore, say that it takes public spirit to deliver it to the collection points."

Director J. Tøffner-Clausen of KommuneKemi at Nyborg adds in this connection:

"As far as the oil waste is concerned, it is quite clear that many people use it themselves for heating purposes, but people have become better at surrendering the inorganic waste. The first time they hand it over, they may be quite shocked that it costs them money. Incidentally, several enterprises are not at all aware of the fact that it is their duty to surrender their chemical waste. Many municipalities are extremely apathetic in this respect and undertake next to no investigations in the area."

7262

CSO: 5000

ERADICATION OF DECIDUOUS TREES TO DAMAGE FOREST ECOLOGY

Copenhagen INFORMATION in Danish 20 Feb 81 p 8

[Article by Bent Søby Madsen, Reporter, Graduate Student]

[Text] Deciduous forests in Denmark are disappearing, and the steadily worsening economic crisis of recent years has forced the National Board of Forestry, which manages one third of the forests in the country, as well as private owners of forests to pursue a more aggressive economic policy, which means that the forests are being exploited beyond capacity.

For one thing, an increasing number of deciduous trees are being felled in areas where they are not protected by forest preservation regulations, and, for the other, conifers are, to an ever increasing degree, being planted in replacement of deciduous trees.

Since the first forest count in 1931, the area of beech and oak forests has dropped by more than one third, and the number of deciduous trees in this country is today smaller than ever before in this century.

This means, in the long run, a deterioration of the environment since the deciduous forest not only gives shelter to a greater variety and a greater wealth of species of birds and animals than the coniferous forest but also offers greater recreational possibilities.

National Board of Forestry

At the establishment of the Ministry of the Environment in 1973, all state forests were placed under the newly established National Board of Forestry, which was given the tasks of ensuring a reasonable production of wood in order for the forests to contribute to the government finances and managing the forests in such a way that they would fulfill the wishes of the population in respect of recreational possibilities.

In the early seventies, this arrangement was viewed with great optimism, but as the first signs of the economic crisis emerged, it became clear that

a conflict would arise between the demands for profits and the desires for recreational areas.

The consumption of wood increased steadily during that period, and in order for the forests to provide reasonable quantities of wood in the future, it was necessary to plant newly cut areas with conifers, which grow considerably faster than beeches, the profits from which can only be fetched by the following generation.

Already between 1965 and 1976 the area of beech forests had declined by 7 percent, so the tendency to replace deciduous trees by conifers was not a new phenomenon, but the rate at which this was taking place increased considerably.

There are no indications that the environment will, in the future, be given higher priority than profit considerations. It is true that committees have been set up in which representatives of the Board of Sports and Open Air Life and the Board of Forestry will discuss what can be done to ensure the population reasonable access to the forests but, at the same time, there is a growing demand for increased production of wood to cover the steadily growing needs.

In the publication of the Ministry of the Environment entitled "The Task of the Board of Forestry 1977-82, as of October 1977," it is stated that the EC expects an increase in production of 1 percent, whereas the consumption will increase by 2 percent, which, of course, is bound to result in demands for increased production.

According to the figures available to the Ministry of the Environment, Denmark already today is one of the leading countries both with regard to the consumption of wood and wood products and the production per unit of area, whereas we are among the countries with the least forest area. Our relative share of the felling, however, constitutes 190 percent. This result can only be maintained if the replacement of deciduous trees by conifers continues.

The Board of Forestry, however, is not the biggest offender, in recognition of its task as administrator of recreational functions. The situation looks worse in privately owned forests where nearly all newly planted trees are conifers.

If oaks were to be planted today, they could only be felled between the years 2050 and 2100, perhaps even later, whereas conifers may be turned into profits already after approximately 10 years.

This means that, on the whole, there is no longer any accumulation of wood in privately owned forests whose owners must base their operations entirely on economic criteria, and this, in turn, has the effect that the access to the privately owned forests ensured the population becomes more or less illusory: what is the use of granting access for the public to a dense and dark spruce plantation, the dead straight fire lanes of which do not provide any experience of nature?

Poor Business

However, on the long view, it is not profitable to replace deciduous trees by conifers. The yield per hectare of beeches is considerably larger than the yield of conifers per hectare. This is primarily due to two factors: for one thing, the major part of the area planted with conifers is located on land of poorer quality than the area planted with deciduous trees, and, for the other, in the areas planted with conifers, the majority of the trees are younger because of the desire for quick profits. Under the same conditions, however, conifers yield approximately twice as much per hectare as beeches--but most conifers do not reach an age where they really yield profits, and the increase in interest rates has not improved their prospects of being allowed to grow any larger in the future.

Jagersborg Forest District

While conifers are thus often felled before they reach their maximum growth, recreational values in other cases have to give way to economic demands. This is the case with half of the old oaks of North Zealand which are found outside the Jagersborg forest district.

The board of Forestry has here approved plans to fell exactly 48 percent of the approximately 180-year-old oaks in the area, for the very reasons that today they are considered to be extremely valuable trees merely from the point of view of forestry economics.

The Danish Society for the Preservation of Natural Amenities has protested against the felling, stating that it is a question of an "unacceptable deterioration of the North Zealand scenery."

The forest is not only of ecological significance (particularly oak forests have an interesting flora and fauna on account of their open and light nature), but the historic value of the forest is also significant. The trees condemned to felling were planted as naval forests. When the Danish navy was stolen or destroyed by the British in 1807, and after the separation of Norway from Denmark in 1814, Denmark lost its importance as a naval power. Economic crises developed, and the oak production dropped, so the old trees were allowed to remain uncut.

The Board of Forestry, however, has not been willing to yield to the argumentation on the part of the Danish Society for the Preservation of Natural Amenities, seeing that K. F. Andersen, forest valuer, does not consider "the oak trees standing in Farum to be particularly conspicuous or remarkable," even if they are the oldest oaks in the area.

In other parts of the country, deciduous trees are also endangered. It is especially to be feared that, after the abolition of the Preservation Plan committees as of 1 January 1979, a more streamlined nature conservation policy will be pursued, since it is now the county councils which will be making decisions on preservation aspects and which accordingly will also be consulted when it comes to deciding whether to fell old forests.

Fewer Animals and Birds

From an ecological point of view, felling of deciduous forests and planting conifers instead is problematic.

It has turned out that in deciduous forest areas there are 25-30 species of birds, numbering approximately 750 pairs per 100 hectares of forest [1 hectare: approximately 2.5 acres], whereas, in a spruce forest, there are only 15 species, numbering approximately 250 pairs per 100 hectares.

The vegetation in beech and oak forests is also considerably more varied than in spruce forests which especially when they grow tall give so much shade that there is no other vegetation at all but conifers.

In 1978, the Forestry Research Society in Denmark published a study which gave a detailed survey of the use by the population of the forests for recreational purposes.

A vast number of data were collected which were to show, among other things, whether the forests were being used sufficiently by the public to justify giving high priority also in the future to the recreational values which are difficult to measure.

The study showed that a so-called median Dane (the average male/female of the study) spent approximately 60 hours on visits to forests annually, and that the entire population thus paid at least 100-200 million visits to the forests in the course of 1 year.

More than nine-tenths of the use of the forests by the population was entirely for recreational purposes, and, of course, one might be tempted to say, also this study showed that it was the well-to-do rather than those who were worst off economically who visited the forests.

A comparison with other studies showed that the forests attract a considerably larger proportion of the adult Danish population than do cinemas, libraries, sports grounds, art exhibitions, theaters, adult education and concert halls.

The forests are, moreover, being used to a much greater extent, measured in terms of time spent in them, than the other above-mentioned recreational possibilities and are only being surpassed by contact with relatives and friends, TV (!), reading and relaxation.

Especially against the background of this study which abundantly confirms the eagerness with which Danes visit Danish forests, it is alarming that the area of deciduous forests will be reduced further.

It is to be hoped that the Board of Forestry, in the future, will be enabled to give higher priority to outdoor life and the 'immeasurable good things' at the cost of the immediate profitableness which, as has been shown, on the long view, results in a decline in the value of the forests, both in respect of the availability of wood and in respect of the recreational value of the individual forest.

Quickset Hedges

Although the tasks of the Board of Forestry are being planned, many growths are today subjected to incredible encroachments.

The consulting services of the Board of Forestry are not being used sufficiently; indeed, several owners of forests are probably not at all interested in these services. Large areas of quickset hedges, newly planted trees and trees standing alone have of recent years been felled on account of the steep increases in oil prices, and the wood has ended up in the woodburning stoves without it having been possible to intervene.

In its publication of 1977, the Board of Forestry complains that the administrative tasks of the forest authorities have grown, for example, the rather uncomplicated procedure previously followed in preservation cases has been replaced by a system 'involving a constant stream of hearings, letters, telephone conversations, meetings, surveys, etc.,' which, in particular, has overtaxed the university educated staff.

However, neither the Nature Conservancy Board nor the Board of Forestry are today able to intervene against the ruthless exploitation of the forests or, for example, thickset hedges, so it is a question whether the entire body of laws governing forestry and changes in existing forests ought not to be re-examined--before all of the deciduous Danish forests have been felled. Either cut up for timber or burned in fireplaces.

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7262

CSO: 5000

FINLAND

PROFESSOR AIRS BIOLOGICAL SUBSTANCES USED IN FARMING

Helsinki UUSI SUOMI in Finnish 18 Feb 81 p 4

[Article by Professor Eero Varis: "Chemical or Biological Farming, No Reason to Aggravate Problem"]

[Text] The author of the article, Doctor of Agriculture and Forestry Eero Varis, is a professor of botany at the Faculty of Agriculture and Forestry in Helsinki University. Professor Varis directs the biological nitrogen fixation project funded by the Finnish Academy. The goal of this project is to promote leguminous plants and to make the symbiotic fixation of nitrogen peculiar to leguminous plants more effective.

In recent years in agricultural discussions as well as in the criticism of consumers aimed at the quality of foodstuffs there have been demands that agriculture change its production methods in such a way that production would be less dependent on imported energy, would pollute the environment less, and that various "poisons", which are argued to be dangerous to the consumer of foodstuffs or to all of us, not be used in the production phase. Biological, biodynamic, natural, ecological, and so on cultivation is being offered in place of the present methods of producing agricultural products.

Natural cultivation means a traditional method of cultivation, which is based on the natural fertility of arable land and in which no external production chemicals are used. Cow manure, peat, or other available types of soil as well as compost, particularly leguminous plants, are used as fertilizers. Natural cultivation can be ecologically sound, but it can also rob nature and even destroy it.

Present-Day Cultivation

Customary or present-day cultivation, which is also called technical-chemical cultivation, is being used as a method of production in the industrialized, scientifically developed countries. Its goal is to produce as much foodstuffs as possible at a beneficial price per surface unit or food producing animal. However, production must guarantee the maintenance of the vegetative power of the soil, the wholesomeness of the products, and the minimalization of environmental damage.

The biological basis of production is made up of effective and refined plants and animals, whose production capacity is "brought out" by means of economically feasible external energy sources and other production incentives. The soil's natural

production capacity can be exceeded by fertilizing plants according to their needs primarily with easily soluble chemical fertilizers, by draining or irrigating fields, by maintaining the soil's biological and technological structure, and by preventing the growth of weeds, diseases, and vermin and insects with chemical measures applied directly to the cultivated plants or weeds.

Biological Methods

The goal of biological cultivation procedures is also to create a lasting ecosystem for the field, which would produce a sufficient amount of wholesome fodder or nourishment. In biological methods emphasis is placed on the importance of the ecology and biology, particularly soil biology as microbiology, in the development and selection of production methods. But they also include concepts which for the time being cannot withstand the criticism of the natural sciences.

Plant nutrition is not based on readily soluble fertilizers, but on the transfer of plant nutrients occurring indirectly through the soil's small organisms as well as on maintaining or increasing the amount of the earth's organic substances, humus. Particular attention is given to microbes attached to free nitrogen in the air, biological nitrogen fixation. Since the most effective among them are the tubercle bacteria of leguminous plants, the cultivation of leguminous plants plays an important role. The elimination of weeds is taken care of by preventative measures implemented in advance or by mechanical means. In the prevention of plant diseases and plant destroying insects disease-resistant varieties produced from plant breeding are used and the plants' resistance is increased by means of suitable cultivation measures or care. Attempts are being made to prevent diseases and plant destroying insects by promoting the growth of their natural enemies and creating a natural balance or by using certain preventative organisms as a biological deterrent.

There are various methods of biological cultivation resulting from doctrines espoused by various teachers. The most well known in the English-speaking countries is Howard-Balfour or organic cultivation. The method practiced in Switzerland or Germany is called organic-biological cultivation, the founders of which are Muller and Rusch. In French-speaking countries biological cultivation travels under the name Lemaire-Boucher cultivation named after the individual who developed it.

Rusch's teachings also include the theory of "the circulation of living substances", which goes beyond current thinking in the natural sciences. Also Boucher's theory of "biological transmutations" or the changing of elementary substances into something else is a concept foreign to the natural sciences. Biological-dynamic or biodynamic cultivation, which in the Finnish language is sometimes called luontois-voimaviljely (power-of-nature cultivation), contains the most ideas foreign to the natural sciences. Its teacher, Rudolf Steiner, presented concepts of the ecosystem and its practical arrangements based on anthroposophy in agricultural courses he conducted in 1924.

In evaluating the quality of products in biodynamic cultivation chemical methods are used in addition to the so-called crystallization method, in which the biological and dynamic quality of a product is interpreted from patterns precipitated in the juice of the plant with an addition of copper chloride. The definite association of biodynamic cultivation with non-natural science teachings would justify the idea

that it is totally its own kind of cultivation, but the representatives of biological cultivation do, however, consider it to be just one of the forms of biological cultivation because of many common goals and practical solutions.

Delineation Is Difficult

The drawing of a line between modern-day cultivation and biological cultivation is difficult since in the practical application of farming methods and production the majority of farmers operates in accordance with the principles of both schools. The most apparent difference in practical measures is the fact that the representatives of biological cultivating methods adopt a negative or very cautious attitude toward the use of chemical fertilizers and plant protection substances. Instead of such substances either compost, animal waste, or unrefined raw fertilizers are used frequently by means of composting. In the protection of plants, as was mentioned above, mechanical means or some kind of plant derivative extracts are used.

The greatest achievement of present-day cultivation is the vast improvement of production per surface unit, animal, and person. As far as biological cultivation is concerned there are no comparative test results in Finland or even comparative statistics. According to test results in Sweden a transition to biological cultivation would cause a drop of 10-20 percent in harvests, but over the years the difference would seem to become smaller. Differences in harvests are, however, greatly dependent on the variety of plants and cultivation conditions. For example, plants such as root plants, potatoes, corn, and fodder which use large amounts of nitrogen, benefit the most from nitrogen fertilizers, which present-day cultivation uses in large amounts.

Economic comparisons of different production methods have produced inconsistent results. In general better prices have been obtained for biologically cultivated products than for products from normal cultivation, which is a result of their scarcity, direct sales, and the willingness of consumers to pay. Since, on the other hand, the proportion of purchased production incentives in production costs is smaller, biological farms have in general achieved profitable production in spite of the increased need for manual labor and smaller harvests. Those seeming to have the best success are relatively small family farms, which can cultivate specialty items and market them at a special price.

Disputed Quality of Products

From the point of view of the consumer in addition to the availability and the price of products their quality is also important, particularly biological quality and wholesomeness. In this respect opinions are rather conflicting. If products are judged on the basis of physical and chemical properties, the research institutes conflict with one another. The fact that in biological cultivation and in the marketing of products quality control can be more effective than in customary mass production is primarily the result of products that spoil easily rather than the better quality of vegetables. The fact that readily soluble plant nutrients are not used in biological production reduces the risk of overfertilizing and improves the suitability of products for storage. The discontinuation of chemical pesticides and herbicides, naturally, eliminates the possibility of their misuse.

Nutrition experts have so far not been able to demonstrate the superiority of biological products with respect to nutrition anymore than their wholesomeness. My own understanding is that depending on the principles of biological production there may be differences resulting from the manner of production with respect to specific use and quality. But in my opinion the importance of these differences is an open question.

Prospects for the Future

Placing present-day cultivation and biological cultivation as alternatives for one another and making them mutually compete as agricultural production methods is aggravating the problem. Among those studying the production of vegetables the understanding is beginning to grow that current production methods cannot be continually developed by increasing the use of energy and resorting to chemical plant protective methods alone. Only in instances of specific specialization have significant achievements been reached in the production of one or a few rare types of plants. A one-sided cultivation rationalized to its maximum will lead to problems in the weakening of the soil's biological capacity to produce and in greater harvest fluctuations. The ecosystem built into a field is too simple and susceptible in making changes against uncontrolled factors.

Research in the various sciences of plant production is making rapid advances in finding more ecological alternatives. Also if the superiority of the quality of biologically cultivated products can be demonstrated, then we can together reach an agreement on the prerequisites and conditions by which all agricultural production can be changed to conform more closely with the principles of biological cultivation.

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COUNTRY'S FIRST HAZARDOUS WASTE FACILITY PLANNED

Helsinki SUOMEN KUVALEHTI in Finnish 20 Feb 81 pp 32-34

[Article by Juhani Virkki: "Waste Deadlock Broken"]

[Text] Following the sale of the land and on the basis of a straw vote, Riihimäki appears to be ready to accept a national hazardous waste plant.

Once collection stations are established, the plant will begin to unload the hazardous material industrial storage depots are filled with. At the same time perhaps concealment of hazardous waste at public garbage dumps, an apparently common practice, will stop.

The plant has been planned since the early 1970's and the dispute over its safety is not yet over with the settlement of its location.

Oy Suomen Ongelmajäte/Finlands Problemvfall Ab [Finnish Hazardous Waste Company] was founded in September 1979 to deal with the nationwide collection, processing and storage of hazardous waste. The ownership of the company is equally divided between the government, the municipalities and industry. Slightly more than 90 industrial plants hold shares in it.

When the company was founded, it was agreed to locate the plant in Southern Finland where about two-thirds of our hazardous waste is accumulated. The search for a site began a year ago in March when the company sent inquiries to over 20 municipalities, almost all of which are situated along the Helsinki-Tampere or Riihimäki-Kouvola rail lines. When Orimattila, which had arisen at the end of the year as a surprise challenger to the strongest contender, Riihimäki, decided against the plant in January, the Hazardous Waste Company once again received notices from some 20 municipalities of their willingness to have the plant located in their areas. Twelve private landowners also offered lots for the plant.

100,000 Tons

About 100,000 tons of hazardous waste a year are produced in Finland. Under the waste-handling law, this is designated as waste which, because of its toxicity or other qualities, is hard to render harmless or handle, or otherwise causes special problems for the environment. We may say that most industrial plants produce

hazardous waste. In individual households too, this accumulates in the form of waste oil, old medicines and insecticides and herbicides.

The Interior Ministry's decision designates waste containing the following materials as hazardous waste:

waste containing oil, solvents or corrosive substances like acids or alkalis;

waste containing antimony, arsenic, mercury, silver, cadmium, cobalt, chromium, copper, lead, manganese, nickel, zinc, thallium or tin;

waste containing nonorganic or organic cyanides or isocyanates;

waste containing organic halogen compounds like polychlorinated biphenyls (PCB);

waste containing phenols, repellent or protective substances, raw materials for medications, medicines or medicinal preparations and other waste materials comparable to the above-mentioned because of their natures or qualities.

In the world's biggest data bank in England, there are the names of 50,000 substances classified as hazardous waste as well as data on their characteristics and how to handle them.

However, these substances are not hazardous waste if they are found in small enough concentrations or in a harmless form as far as the environment is concerned, so that they can be collected, stored and treated along with other kinds of waste without any danger. Radioactive waste or explosives do not fall within the jurisdiction of the hazardous waste plant either.

Four Plants

There are only four national or municipal hazardous waste plants in the world: two in the FRG, one in Austria and one in Denmark. The Finnish Hazardous Waste Company has closely cooperated with the Danes. The preliminary plan for the Finnish plant was purchased from the Chem-Control A/S Company, which was responsible for the Kommune Kemi plant, located in Nyborg. As for Kommune Kemi, it is training Finnish plant employees.

The cost of the Finnish hazardous waste plant will amount to over 100 million marks, with construction costs running from 20 to 30 million. The Hazardous Waste Company will pay for the construction of the plant. Once it is finished, the plant is not expected to produce a profit, but it must support itself. The plant's sources of income will be the sale of the heat and electricity that is produced for the energy needs of the local community at the site, payments for handling and treatment received from waste producers and selling materials culled as usable in the treatment processes back to industry.

During the construction phase, the plant will employ a couple of hundred people. If the first construction phase is begun this year, according to plan the entire plant will be finished by the mid-1980's. The staff will then consist of from 80 to 100 employees. First, they will build the incinerator and try to make a test run of the physical-chemical plant in January 1984.

Legal Requirement

According to the change in the waste-handling law that is to go into effect in early April, industrial plants must themselves render their hazardous waste harmless or ship it elsewhere for treatment. Plants must then for inspection purposes, provide officials with a notice of the waste to be delivered and its destination.

At present industrial plants either fill their storage facilities with hazardous waste or ship it to public garbage dumps. A recent study of the Seutula dump made in Vantaa indicates, for example, that at least 800 tons of hazardous waste a year is brought there.

During the first phase of hazardous waste plant operation, the situation will change so that about 10 collection stations and a waste-reception storage facility at the plant site will be built in different parts of the country. The preliminary report, with the aid of which the locations of the collection stations will be chosen, is now in progress and this does not require any decision-making on the part of the municipalities. The future collection stations will be built at a distance of over 100 km from the hazardous waste plant alongside rail lines or in the immediate vicinity of spur lines. It is estimated that altogether from 10 to 15 truckloads of hazardous waste a day will be picked up from the collection stations and from three to four rail shipments a week.

Waste Treatment

Of the treatment units, the incinerator, which is included in the first construction phase, will destroy hazardous waste in the 900-1300° temperatures of its revolving and afterburner ovens. Smoke gases will be conducted from the ovens to the steam boiler where heat for remote heating and electricity are collected and stored. Before these gases whirl off into the sky through smokestacks some 100 meters high, they are run through electric filters and cleaning devices.

The hazardous waste plant's other treatment units include a physical-chemical plant for treating acids, alkaline cyanides and heavy metals, a waste-oil and solvent regeneration plant and a solvent distillery.

In addition, even before the test run is made, a laboratory will be completed which will be used to examine all shipments arriving at the plant, analyze the products of the different processes involved, keep watch over the plant environment, participate in advising industrial plants, engage in research on the reutilization of industrial products and cooperate with the State Technical Research Center and different universities.

The hazardous waste plant will produce waste too, among others, dust from the incinerator and so-called filter cakes from the physical-chemical plant for which the plant has a special dumping ground. The bottom of this dump is lined with clay, a special water-tight rubber mat and a half a meter of limestone. Treatment plant waste materials will be deposited in different places and covered with soil daily. Rainwater falling on the dump will be fed into the local sewage network through the plant's water-purification system.

The hazardous waste plant will, for example, produce small amounts of heavy metals which, because of the danger involved, will not be buried in the special dumps. The fate of such waste materials has been the subject of negotiations between the Nordic countries and certain Western European countries aimed at joint treatment. Another alternative would be to store such waste in abandoned mines either in Finland or abroad.

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BRIEFS

HAZARDOUS WASTE SITE DECIDED—Riihimäki (RS)—Construction will begin on the national hazardous waste plant in Riihimäki next fall since the Riihimäki Municipal Council approved a tough agreement on the sale of a building site on Monday evening. The hazardous waste plant will get a 15-hectare lot right on the fringes of the city, bordering on Hausjärvi. The sales price is 2 million marks. The plant was offered to 25 municipalities in Southern Finland but not one of them reached a favorable decision before Riihimäki did. The hazardous waste plant met with exceptionally tough opposition in Riihimäki too. Nearly 8,000 names were collected against it and the Riihimäki movement opposing the plant got two councilmen elected during the fall municipal elections. Council factions were divided in the voting, but the decision to sell was reflected more clearly than expected with a vote of 25 to 17 and one abstention. [Text] [Helsinki HELSINGIN SANOMAT in Finnish 25 Feb 81 p 3] 11466

CSO: 5000

ATHENS MUNICIPALITY ASSUMES ANTI-POLLUTION CAMPAIGN

Athens TA NRA in Greek 23 Mar 81 p 1

[Interview with KEP Director D. Geroukalis by Georges Doustsis: "Help! Athens Pollution Exceeded Allowable Limits by 300%"]

[Text] The municipality of Athens is taking a strong stand against the dreadful pollution which slowly but steadily is undermining--as long as no measures are taken--the health of its residents. With the establishment of the Environmental Research Center [KEP] the city has assumed its responsibility to protect the health of its residents and already part of a long-range program has been implemented.

"It is about time that the local self-government has become concerned with the pollution sector since for years now our health has been ruined and the indicators of pollutants in the Athens atmosphere create only great anxiety," said KEP Director D. Geroukalis, a medical doctor who [in an interview] has cited disconcerting data concerning the extent of the capital area pollution--indisputable data provided by the Athens Area Pollution Control Program [PERPA] which is an agency of the Social Services Ministry. [The interview is as follows:]

[Question] Everyone is talking about the celebrated [smog] cloud. What kind of pollution is it?

[Answer] Our only indications are that is a photochemical pollution. We have the "cloud" even on cloudy days. It must be smog. This can be pinpointed with radio sondings--measurements, that is, of the atmospheric changes. Such measurements are being carried out by the Meteorological Service at the Ellinikon [Airport] only. The Keratsini-Kifisia axis has no facilities for such measurements.

[Question] What are the highlights of the roundtable discussion organized by the Athens KEP?

[Answer] All speakers emphasized that it is a mistake to say that pollution only harms people. Smog affects the whole flora and fauna world and disturbs the ecological balance by harming cultivations, trees, bees, and so on. The ministry often says that the wind has carried the cloud in the direction of Paros [Mountain]. But this does not mean anything since the cloud's pollutants will surely affect another area.

It was also mentioned during the discussion that pollution and mortality are conclusively interrelated and that there is a chronic and severe impact on people, especially children and the elderly. As an example, the Salamis area was mentioned where 17 percent of lung disease is due to pollution as compared to rural areas. The Keratsini station of the Public Power Corporation (DEI) alone burns up 1 million tons of oil annually and our country does not have national standards for determining the maximum allowable pollutant content in the atmosphere.

[Question] How did KEP start out?

[Answer] Besides the strong need for intervention by local self-government, the new Code for Municipalities and Communities provides the opportunity for such intervention in matters concerning the environment. The Environmental Protection Committee recommended to the municipal authorities the establishment of KEP. It is the first time that such a center has been established within the framework of local self-government.

[Question] What is the KEP program?

[Answer] It is [based on] a general environmental planning: pollution control through laboratory analyses, tests for finding out if residues of pesticides and herbicides exist in fresh fruits and vegetables--a problem which is becoming a national one due to the imprudent use of such chemicals and to the lack of effective controls.

[Question] [What about] the issue of garbage?

[Answer] An analysis and examination of our capability for changing garbage into fertilizers is being studied. We are also studying the control of water being distributed by private companies as well as of bottled water.

[Question] How is the type of pollution pinpointed?

[Answer] We have the cooperation of the National Meteorological Service [EN] since we do not have our own meteorological stations in Athens. The meteorological data are thus being analysed and the temperature changes can be forecast. This service, which could make possible the forecasting of smog especially in industrial areas, has not been available until now.

[Question] Will you be occupied with the problem of pollution impact?

[Answer] Under the present pollution conditions, life in the city is an acute physical and mental health problem. We have already started, in cooperation with PERPA and EY, an epidemiological study on the relation between pollution-meteorological phenomena and illness incidence-mortality in 1978. We have taken, that is, filed data on pollution measurements and daily meteorological information and compared them with each other and with the illness incidence as determined by the [number] of patient admissions in hospitals. In the case of lead which is very dangerous, we cooperate with "Dimokritos" Department of Physics Director Vourlopoulos in finding the relation between lead in children's blood and their mental retardation.

[Question] Are there any other KEP activities?

[Answer] We shall have an educational program for furthering environmental awareness; we shall deal with legal, technical, economic, and technical questions; and we shall establish cooperation with responsible agencies such as the Technical Chamber of Greece (TEK), E.Y., PERPA, and so on, and with corresponding (anti-pollution) centers abroad. Of course, the municipal authorities will always propose specific studies and solutions and will drastically intervene in the activities of the central authority. Already KEP has established its headquarters in the public building housing the Red Cross at 2 Aim. Daphnis Street.

[Question] Who are KEP's cadres?

[Answer] You should know that a number of machines is a gift of the Munich Technical University. The committee and the leadership consist of distinguished professionals--chemists, physicians, biologists, meteorologists, lawyers, and so forth. Already the Athens municipality is using mufflers in its compressors and the contractors for municipal projects are obligated to do the same for the protection of the public from noise pollution. For the protection of the children particularly we have made certain recommendations during the seminar organized by the League of Greek Professional Women.

[Question] Any additional activity?

[Answer] We have dealt with the problem of water quality being used by the residents of the Glyke Nera, Gerakas, Stavros, and Gargitos and soon we will undertake a campaign to enlighten the people on this problem.

The "Guilty..."

The following table lists the "participant" pollutant percentage:

Pollution Source	Sulfur Dioxide	Floating Particles	Carbon Monoxide	Nitrogen Oxides
Industries	10-11	95-96	3.2-3.0	63-65
Use of Industrial Fuels	39-43	1-1	0.6-0.6	12-13
DEI-Keratsini Station	34-37	--	--	7-7
Automobiles	6-9	3-3	96.0-96.4	14-15
Central Heating [buildings]	9-0	1.0-0.0	0.2-0.0	4.7-0.0

The table shows the percentage participation in the pollution of Athens by the various sources of pollution. The data with which the authorities must be concerned immediately are those of the nitrogen oxide percentage of 63-65 produced in the atmosphere by industries as well as the 95-96 percentage of floating particles released by industries. A very great contributor to the pollution of the atmosphere is the automobile which emits into the atmosphere 96.48 percent of carbon monoxide while the state-owned DEI station in Keratsini produces 37 percent of sulfur dioxide.

These percentages refer to the total quantities of pollutants in the atmosphere. The first figure refers to the average winter count and the second figure to the average summer count.

Limits Have Been Exceeded

Table of Pollutants

	Sulfur Dioxide	Nitrogen Oxide	Smoke
Maximum Allowable Limit	80	100	1.00
Maximum Count in Athens	339	409	4.56

These counts refer to the number of micrograms per cubic meter of atmospheric air, excluding the carbon monoxide which is counted in milligrams. These data were derived from measurements made in areas of Athens and are the highest observed during the January-February 1981 period. The immense accumulation of pollutants which are dangerous to our health have reached a point of "alert" if compared to the maximum allowable limits.

With regard to smoke, it is made clear that the measurements are determined by the unit COH/100LF. From 1-9 is average, from 2.0-2.9 is high, and from 3-3.9 very high. Any count over the average creates an impact on people.

The Impact

When smoke surpasses the average count, it creates vision problems, aggravates lung diseases, increases illness incidence (admissions to hospitals) and mortality.

Depending on its content in the air, carbon dioxide causes headaches, decreases mental alacrity, and causes tendencies to faint and vomit.

Floating particles (dust) cause irritation to the respiratory organs, and together with sulfur dioxide increase the incidence of illness.

Nitrogen oxides aggravate bronchitis in children, cause increased elasticity in the pores of the lung, and affect the defensive ability of the body especially in children and the elderly.

The sulfur dioxide affects the respiratory system, cooperates with the floating particles as a mucous-irritating substance (eye pain, for example). It is the only pollutant which, as research has proven, is related to increased mortality.

Lead affects the physical and mental capacity of people and especially of children. In West Germany where the maximum allowable limit is lower--even lower than that set by EEC at 0.15 grams per liter--it has been found that it affects the mental development and perceptive ability of children especially in the inner city. In Athens where we have 0.4 grams per liter and where we have schools, playgrounds, and so forth, in the center of the city, the tragic repercussions on children are self-evident.

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REVISION OF EARTHQUAKE RESISTANCE CODE SUGGESTED

Athens I KATHIMERINI in Greek 11 Mar 81 p 2

/Text/ "A geologist must always participate in planning the foundations of large buildings as is done in all advanced countries."

This statement was included in yesterday's press release of the Greek Geologists' Association which proposed that the Earthquake Resistance Regulations (1959) be replaced by a new modern code which must be drafted with the participation of the necessary professional personnel (geophysicists, seismologists, geologists, civil engineers, architects, and so on).

The planning must be based on the following infrastructure tasks:

1. A detailed geological mapping of the earthquake-prone areas complete with geophysical studies and soil tests to locate the water level and the nonvisible crevices, and to locate and outline the strata of the subsoil.
2. Immediate conduction of seismo-tectonic studies in most earthquake-prone areas in the country (Ionian Islands, Korinthian Gulf, Gianitsa Basin, Lokris, Volos, Langada Basin, and so forth).
3. Detailed mapping of inhabited areas using the method of micro-zonal subdivision under the supervision of expert geologists.
4. Detailed aerial photographing of earthquake-prone areas to aid the task of the detailed mapping.
5. Supplying the seismologists with the proper equipment (geologists should take part in installing the instruments and in evaluating the data since the results will be related to the geological structure of the area where the instruments are located).

PAKOE

On the other hand, the Panhellenic Center of Ecological Research /PAKOE/ stressed in a press release yesterday: "The main reason for the damages is the chaos which exists in the city plan in Athens, because there was never a zoning plan for the

buildings being constructed nor was the 1965 earthquake resistance code implemented. This is shown by the fact that neither in Athens nor in any other city in Greece has there been a mapping of micro-zones of seismic probability." PAKOE proposes that the following measures be taken:

1. Construction of buildings with few stories in areas overloaded with dense and high-rise construction.
2. Relieving, through planned construction, city blocks of one-sided loads.
3. Development of open areas free of buildings and the construction of beltways for relieving traffic.
4. Immediate geological mapping and distribution of seismic micro-zones in the Attiki area.
5. Immediate checking of the repair work.

No Law Exists

The government decided to help the earthquake victims and to restore the damages they suffered because it felt that this was the right thing to do, not because it was required by law.

This point was underlined in a press release yesterday issued by the Ministry of Finance in which the rumor is being denounced that ostensibly the exact intensity of the 24 February earthquake was not made public because otherwise the government would have been obligated to compensate the earthquake victims.

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May 4, 1981

